. 948/4

Vol. 948 Number 4

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

July 27, 1976

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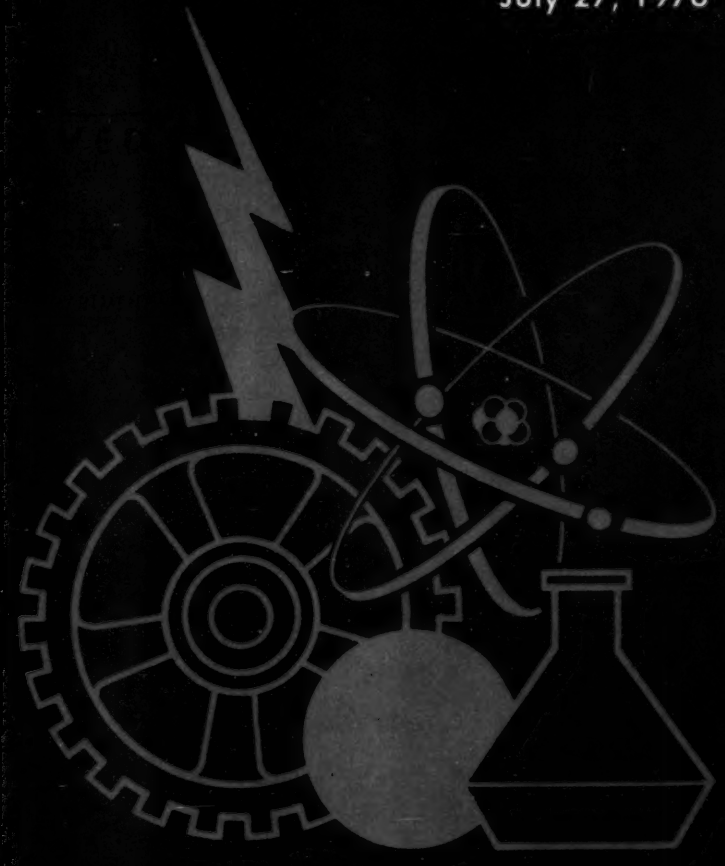

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OFFICIAL GAZETTE of the
UNITED STATES PATENT and TRADEMARK OFFICE

July 27, 1976 Volume 948 Number 4

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PATENT NOTICES

Certificates of Correction for the Week of July 27, 1976

P.P. 3,154	3,867,875	3,930,153	3,947,943
P.P. 3,688	3,868,354	3,931,240	3,948,112
P.P. 3,689	3,869,358	3,932,326	3,948,664
Re. 28,594	3,876,449	3,932,909	3,948,905
3,325,567	3,879,388	3,933,110	3,948,966
3,569,870	3,879,684	3,933,136	3,949,301
3,618,602	3,879,730	3,933,979	3,949,750
3,620,706	3,882,135	3,933,991	3,949,858
3,641,328	3,884,837	3,934,738	3,950,162
3,741,757	3,886,210	3,935,122	3,950,195
3,749,489	3,887,134	3,935,145	3,950,234
3,753,974	3,887,374	3,935,269	3,950,257
3,753,975	3,888,909	3,936,430	3,950,672
3,756,939	3,888,982	3,937,197	3,952,130
3,757,198	3,890,129	3,937,410	3,952,257
3,758,436	3,890,645	3,937,762	3,952,487
3,761,866	3,891,781	3,937,861	3,952,776
3,777,857	3,894,049	3,937,982	3,953,234
3,781,219	3,895,930	3,938,057	3,953,304
3,790,756	3,898,407	3,938,053	3,953,607
3,794,675	3,899,771	3,939,092	3,953,752
3,795,435	3,900,449	3,939,135	3,953,929
3,799,998	3,905,522	3,939,361	3,954,217
3,801,800	3,906,049	3,939,750	3,954,611
3,802,222	3,908,013	3,940,219	3,954,648
3,806,433	3,912,024	3,941,047	3,954,738
3,809,065	3,912,666	3,941,102	3,954,808
3,809,593	3,913,398	3,941,751	3,954,862
3,811,420	3,914,963	3,941,756	3,955,011
3,813,106	3,915,458	3,941,985	3,955,108
3,815,119	3,917,549	3,942,351	3,955,119
3,815,919	3,918,409	3,942,639	3,955,214
3,822,291	3,918,511	3,943,049	3,955,219
3,822,303	3,919,079	3,943,131	3,955,369
3,823,163	3,919,380	3,943,321	3,955,379
3,823,989	3,920,464	3,943,809	3,955,534
3,824,272	3,921,154	3,943,974	3,956,045
3,830,715	3,922,243	3,944,125	3,956,236
3,831,240	3,922,707	3,944,337	3,956,582
3,835,245	3,923,723	3,944,465	3,956,703
3,840,791	3,923,997	3,944,653	3,956,903
3,840,793	3,925,293	3,945,163	3,957,351
3,846,410	3,926,944	3,945,216	3,957,940
3,847,764	3,927,083	3,945,218	3,958,006
3,849,065	3,927,265	3,945,906	3,958,068
3,852,317	3,927,307	3,946,113	3,958,183
3,852,379	3,928,053	3,946,447	3,958,401
3,856,924	3,928,149	3,946,949	3,959,243
3,857,375	3,928,288	3,947,068	3,959,517
3,859,639	3,928,325	3,947,136	3,959,630
3,860,601	3,928,988	3,947,565	3,960,157
3,862,391	3,929,675	3,947,641	3,960,787
3,863,906	3,930,067	3,947,902	

Disclaimer and Dedication

3,949,226.—*James A. Dugan*, Lake Forest, and *Yong S. Park*, Hanover Park, Ill. AUTOMATIC LIGHT INTENSITY CONTROLLER FOR CRT LIGHTHOUSE. Patent dated Apr. 6, 1976. Disclaimer and dedication filed June 1, 1976, by the assignee, *Zenith Radio Corporation*.

Hereby disclaims and dedicates to the Public claims 1, 3, and 7–12 of said patent.

Dedications

2,998,430.—*Frank J. Sevigne*, Tarrytown, N.Y. PROCESS FOR PREPARATION OF ALPHA TOCOPHEROL. Patent dated Aug. 29, 1961. Dedication filed May 20, 1976, by the assignee, *General Mills, Inc.*

Hereby dedicates to the Public the remaining term of said patent.

3,035,981.—*Frank J. Sevigne*, Tarrytown, N.Y. PROCESS FOR EXTRACTING VITAMIN A FROM SOURCE OILS. Patent dated May 22, 1962. Dedication filed May 20, 1976, by the assignee, *General Mills, Inc.*

Hereby dedicates to the Public the remaining term of said patent.

3,187,011.—*Frank J. Sevigne*, Tarrytown, N.Y. PREPARATION OF TOCOPHEROLS. Patent dated June 1, 1965. Dedication filed May 20, 1976, by the assignee, *General Mills, Inc.*

Hereby dedicates to the Public the remaining term of said patent.

Disclaimers

3,267,934.—*William E. Thornton*, Chapel Hill, N.C. ELECTROCARDIAC COMPUTER. Patent dated Aug. 23, 1966. Disclaimer, filed June 1, 1976, by the assignee, *Del Mar Engineering Laboratories*.

Hereby enters this disclaimer to claims 15 and 16 of said patent.

3,580,748.—*William T. Delong*, Manchester Township, York County, Pa. WELDING FLUX COMPONENT. Patent dated May 25, 1971. Disclaimer filed June 1, 1976, by the assignee, *Teledyne, Inc.*

Hereby enters this disclaimer to claim 4 of said patent.

3,611,910.—*John S. Hughes*, East Rochester, N.Y. CORN POPPER. Patent dated Oct. 12, 1971. Disclaimer filed May 25, 1976, by the assignee, *Ropat Corporation*.

The term of this patent subsequent to Jan. 9, 1981, has been disclaimed.

3,890,460.—*Lee C. Haas* and *Lynn Parker West*, Raleigh, N.C. COMMUNICATIONS ENABLING METHOD AND APPARATUS. Patent dated June 17, 1975. Disclaimer filed June 4, 1976, by the assignee, *International Business Machines Corporation, Inc.*

Hereby enters this disclaimer to claims 1 through 15 of said patent.

3,931,382.—*Donald E. Witkin*, Warren, Pa. METHOD FOR RAPID ISOSTATIC PRESSING. Patent dated Jan. 6, 1976. Disclaimer filed June 1, 1976, by the assignee, *National Forge Company*.

Hereby enters this disclaimer to all claims of said patent.

3,951,960.—*James C. Heath*, Norwood, *Raymond E. Werner*, Wyoming, Ohio; *John W. Delaney*, Fort Mitchell, Ky., and *Nathan N. Crounse*, Cincinnati, Ohio. NOVEL CRYSTALLINE FORMS OF OPTICAL BRIGHTENERS. Patent dated Apr. 20, 1976. Disclaimer filed May 26, 1976, by the assignee, *Sterling Drug Inc.*

Hereby enters this disclaimer to claims 1, 2 and 3 of said patent.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JUNE 30, 1976

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-2-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Sterolds; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-2-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	10-1-75
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	9-17-75
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	12-17-75
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	5-21-75
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	11-3-75
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	9-19-75
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	1-2-76
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-5-75
DESIGNS, GROUP 290—C. D. QUARFORTH, Director Industrial Arts; Household, Personal and Fine Arts.	4-14-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	9-24-75
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	2-3-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	12-15-75
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	6-25-75
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	12-8-75

Expiration of patents: The patents within the range of numbers indicated below expire during July 1976, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 82nd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,893,005 to 2,897,490 inclusive
Plant Patents..... Numbers 1,830 to 1,835 inclusive

REISSUES

JULY 27, 1976

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

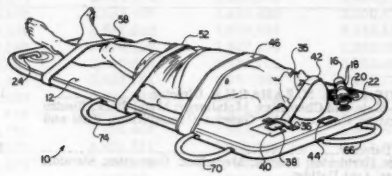
Re. 28,916
INFLATABLE AQUATIC RESCUE BOARD AND METHOD OF RESCUE

Charles A. Rice, R.D. No. 4, Chambersburg, Pa. 17201, and Michael L. Foust, 205 W. Church St., Lock Haven, Pa. 17745

Original No. 3,775,782, dated Dec. 4, 1973, Ser. No. 239,732, Mar. 30, 1972. Application for reissue Aug. 8, 1974, Ser. No. 495,761

Int. Cl.² A47B *83/42*

U.S. Cl. 5—82 R **9 Claims**



1. An inflatable aquatic rescue board comprising:

an inflatable bag of impervious material having two substantially parallel broad faces in alignment with each other and constrained to be separated by not more than a maximum distance, [by internal members] said bag being generally rectangular and having two longitudinally extending sides and transverse head and foot ends respectively;

said bag being rolled up from the foot end to the head end in the deflated condition;

manually actuable means disposed adjacent the head end and coupled to inflate the bag when activated; and

arm receiving means disposed adjacent the head end for enabling a rescuer, while the bag is uninflated and partially rolled and while positioned at the unrolled end, to place the unrolled portion of said bag adjacent the back of an injured person with the arm extending along the spine, the bag unrolling fully under the injured person [during inflation] *and being inflated.*

Re. 28,917
WIRE UNREELING SYSTEM

Marvin E. Harris, Jr., Florence, Ala., assignor to Reynolds Metals Company, Richmond, Va.

Original No. 3,879,978, dated Apr. 29, 1975, Ser. No. 431,084, Jan. 7, 1974. Application for reissue Sept. 18, 1975, Ser. No. 614,365

Int. Cl.² B21F *1/02*

U.S. Cl. 72—183 **10 Claims**

1. Apparatus for unreeling wire from a coil in a direction along an extension of the axis of the coil which comprises:

a. a first annular constriction through which the wire is initially withdrawn from the coil,

b. rotatable means around which the wire is entrained in frictional engagement before it is withdrawn under tension,

c. a second annular constriction through which said wire passes after said first annular constriction but prior to being entrained on said rotatable means,

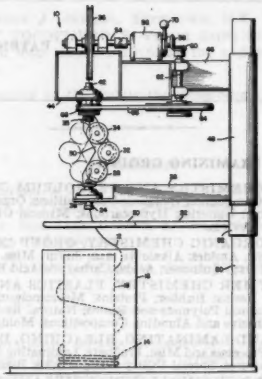
d. untwisting means for untwisting the wire located between said first and second annular constrictions,

e. and motor drive means for positively driving said untwisting means regardless of the tension on said wire,

f. said untwisting means comprising:

1. several rollers about which said wire is entrained to travel in a sinuous path so that said wire is bent first in one direction and then the other,

2. a common support on which said rollers are journaled with said common support being driven by said motor drive means and swung about an axis passing between said first and second annular constrictions,



g. said motor drive means being a variable speed means with means for varying said speed independently of the rotation of said rotatable means during the operation of said apparatus.

Re. 28,918
COMPONENTS OF A ROTARY PISTON MACHINE

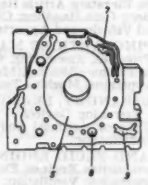
Gerhard Philipp Humbert, Margarethenhohe Uber Konigswinter, Germany, assignor to Electrophysikalsche Anstalt Bernard Berghaus, Vaduz, Liechtenstein

Original No. 3,728,051, dated Apr. 17, 1973, Ser. No. 89,589, Nov. 16, 1970. Application for reissue Mar. 11, 1974, Ser. No. 449,997

Claims priority, application Switzerland, Dec. 12, 1969, 18507/69

Int. Cl.² B01K *1/00;* **C23C** *11/16*

U.S. Cl. 418—178 **2 Claims**



3. *Trochoid housings, side and central units for a rotary piston machine, made of a material selected from the group consisting of iron and steel, particularly cast iron, and provided with ionitrided hardened areas limited to the wiped surfaces; characterized in that the hardened areas throughout the wiped areas are provided with an iron nitride zone reduced to less than 10 microns thickness, with a surface roughness not exceeding* $R_a = 0.8$ *micron, with a corrosion resistance relative to fuel combustion residues by at least*

300 percent, with a thermal resistance up to 500°C over long periods and, respectively, up to 800°C over short periods and with a ductility reduced by not more than 100 percent as compared to the basic material.

Re. 28,919

SPEECH PROCESSOR USING CONTROLLED CENTER CLIPPING

David Arthur Berkley, New York, N.Y.; Olga Mary Mracek Mitchell, Summit, N.J., and John Robinson Pierce, Pasadena, Calif., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Original No. 3,699,271, dated Oct. 17, 1972, Ser. No. 89,633, Nov. 16, 1970. Application for reissue Oct. 11, 1974, Ser. No. 513,991

Int. Cl.[2] H04B *3/20*

U.S. Cl. 179—170.8 **12 Claims**

1. For a voice communications system containing imperfectly isolated transmit and receive paths, apparatus for reducing echo caused by leakage therebetween, comprising:

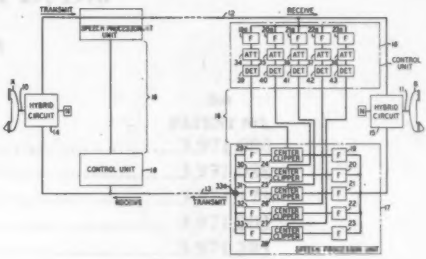
means for dividing the transmit path signal into plural contiguous subbands,

means for producing, from an incoming voice signal in the receive path, a replica of the echo of said voice signal occurring in each of said transmit path subbands,

means for continuously detecting the peak level of each said echo replica,

means for center-clipping the signal in each transmit path subband a varying amount in response to the concurrent said peak level value, sufficient to [just] *substantially* overcome said echo in the respective subband, and

means for combining the outputs of each center-clipping means for transmission.



PATENTS

GRANTED JULY 27, 1976

ERRATA

For CLASS	See PATENT NO.
004-173 R	3,971,080
017-025	3,971,088
053-029	3,971,173
056-370	3,971,203
089-014 C	3,971,285
104-135	3,971,314
114-032	3,971,421
176-032	3,971,444
351-058	3,971,542
272-056.5 R	3,971,561
297-452	3,971,587
308-238	3,971,606
229-037 R	3,971,612
156-104	3,971,668
156-181	3,971,669
156-196	3,971,670
428-537	3,971,680
162-226	3,971,689
526-317	3,971,766
526-065	3,971,767
526-068	3,971,768
424-347	3,971,810
174-041	3,971,894
235-054 R	3,971,914
235-061 NV	3,971,915
328-206	3,971,960
357-039	3,972,014

PATENTS

GRANTED JULY 27, 1976

ERRATA

CLASS	PATENT NO.
004-173 R	3,971,080
017-025	3,971,088
053-029	3,971,173
056-370	3,971,203
089-014 C	3,971,283
104-135	3,971,314
114-032	3,971,421
176-032	3,971,444
351-058	3,971,542
272-058.5 R	3,971,581
297-452	3,971,787
308-238	3,971,808
229-027 R	3,971,812
156-104	3,971,868
156-181	3,971,869
156-196	3,971,870
428-537	3,971,880
162-226	3,971,889
356-317	3,971,766
356-065	3,971,767
356-068	3,971,768
424-347	3,971,810
174-041	3,971,894
235-054 R	3,971,914
235-061 MV	3,971,915
328-206	3,971,960
357-039	3,972,014

PATENTS

GRANTED JULY 27, 1976

GENERAL AND MECHANICAL

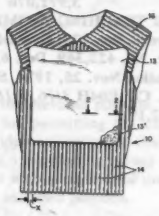
3,971,072
LIGHTWEIGHT ARMOR AND METHOD OF FABRICATION

Richard A. Armellino, 17 Forestdale Drive, Huntington, N.Y. 11746

Continuation-in-part of Ser. No. 157,555, June 28, 1971, which is a continuation-in-part of Ser. No. 710,407, March 4, 2968, abandoned. This application Apr. 18, 1972, Ser. No. 245,111

Int. Cl.[3] F41H *1/02*

U.S. Cl. 2—2.5 **13 Claims**



1. A protective material comprising:
1. a plurality of layers of flexible ballistic material,
2. said layers of material being formed of woven continuous filament synthetic yarns,
3. securing means extending along spaced continuous paths interconnecting said layers,
4. said securing means comprising a plurality of continuous uninterrupted stitches at least through a substantial portion of each path with each stitch interconnecting said layers together,
5. said paths being spaced a distance no greater than three-fourths of an inch and no less than one-eighth of an inch, and
6. a sheet of relatively hard non-woven anti-ballistic material secured to one side of the secured layers of ballistic material.

3,971,073
ARTIFICIAL INTRAOCULAR LENS

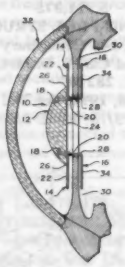
William Richards, Medway, and Bernard Grolman, Worcester, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Apr. 9, 1975, Ser. No. 566,468

Int. Cl.[3] A61F *1/16*

U.S. Cl. 3—13 **10 Claims**

1. A pseudophakos comprising:
a lens;
an array of wire anterior and posterior iris clips;
a number of openings extending into one side of said lens, each located a substantial distance inwardly of the lens edge;
each anterior iris clip of said array having its opposite ends extended into and anchored within one of a preselected pair of said openings, said anterior clip being bent adjacent said lens surface to extend from said pair of openings laterally of said lens;
each posterior iris clip of said array having its opposite ends also extended into and anchored within one of a preselected pair of said openings, said posterior clip being further extended a substantial distance away from said side of said lens and thence bent to extend laterally of said lens.



3,971,074
SHOWER-BATH ARRANGEMENT

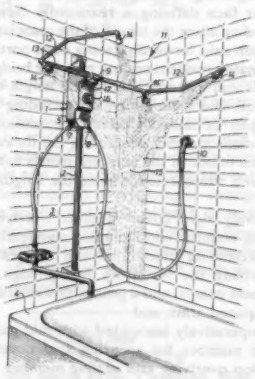
Leif Johan Yxfeldt, Storgatan 59, 115 23 Stockholm, Sweden

Filed Oct. 29, 1974, Ser. No. 518,634

Claims priority, application Sweden, Oct. 29, 1973, 7314675

Int. Cl.[3] A47K *3/22*, *3/08*

U.S. Cl. 4—145 **22 Claims**



1. Shower-bath arrangement, comprising:
a vertical support member;
a slidable member which is displaceable on said vertical support member and which is adjustable upwardly and downwardly on said vertical support member, said slidable member being provided with means for connection to a source of water supply;
a shower arm comprising at least two shower nozzles mounted thereon, said shower nozzles being arranged to emit substantially conical water jets, said nozzles being adjustable to direct said water jets to strike one another angularly within a mixing zone located between said nozzles, as seen in a horizontal projection; and

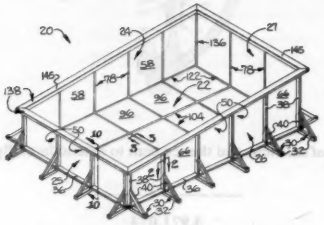
pivotable mounting means for mounting said shower arm to said slidable member and defining with said shower arm a substantially horizontal axis about which at least a portion of said shower arm is swingable for adjustable setting of the inclination of at least said portion of said shower arm relative to the horizontal plane.

3,971,075

SWIMMING POOL STRUCTURE

Kenneth D. Heinbaugh, 144 Canterbury Road - South, Charlotte, N.C. 28211, and Carl F. Seibert, Jr., 3208 Frederick Place, Charlotte, N.C. 28210

Filed May 8, 1974, Ser. No. 467,894
Int. Cl.² E14H *3/18;* **E04C** *2/00;* **F16B** *5/00*
U.S. Cl. 4—172.19 **25 Claims**



1. A fluid tight joint assembly suitable for use in swimming pools or the like and comprising

a pair of adjacent waterproof panels, each of said panels including a side edge positioned in a predetermined orientation adjacent the side edge of the adjacent panel, a front face defining a forwardly facing edge portion extending along the length of the associated side edge, and a rear face defining a rearwardly facing edge portion extending along the length of the associated side edge and beneath said forwardly facing edge portion,

an elongated resilient sealing member bridging the adjacent panels and extending along the length of the side edges thereof, said sealing member including a medial portion and pair of laterally directed extensions, each of said extensions sealably contacting the forwardly facing edge portion of one of the adjacent panels to form a seal therebetween which extends along the length of the edge portion,

a relatively rigid cover member overlying said resilient sealing member and including a generally flat upper portion extending laterally beyond said sealing member and contacting the forwardly facing edge portions of the adjacent panels, and a pair of downwardly directed laterally spaced arms, and

means operatively associated with said pair of arms of said cover member for securing said cover member in its position overlying said sealing member to thereby maintain the assembly of the cover member and sealing member with the adjacent panels, and including a relatively rigid base member positioned between said side edges of the panels and including lateral side arms overlying the rearwardly facing edge portion of the adjacent panels and an upright flange having a generally T-shaped cross-section to define a bulbous end, and with said arms of said cover member substantially surrounding said bulbous end of said flange to operatively engage the same and with said medial portion of said sealing member positioned intermediate said flange and arms.

18. A fluid tight joint assembly suitable for use in swimming pools or the like and comprising

a pair of adjacent waterproof panels, each of said panels including a side edge positioned in a predetermined orientation adjacent the side edge of the adjacent panel and a front face defining a forwardly facing edge portion extending along the length of the associated side edge, and

an elongated resilient sealing member of translucent elastomeric material bridging the adjacent panels and extending along the length of the side edges thereof, said sealing member including a medial portion and pair of laterally directed extensions with each of said extensions overlying one of the forwardly facing edge portions of one of the adjacent panels, and a layer of translucent adhesive positoned intermediate each extension and the associated forwardly facing edge portion to form a seal therebetween which extends along the length of the edge portion,

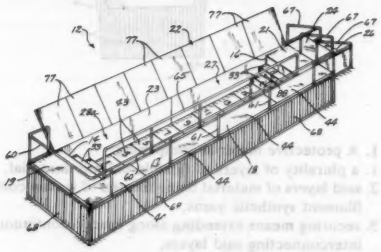
whereby the effectiveness of the seal between the adjacent panels may be visually checked by observing the appearance of the edge portions of the panels which show through the extensions of the sealing member.

3,971,076

POOL FOR TEACHING SWIMMING TO A CHILD

Claude W. Ahrens, Box 275, Grinnell, Iowa 50112

Division of Ser. No. 422,349, Dec. 6, 1973, abandoned. This application Nov. 25, 1974, Ser. No. 526,492
Int. Cl.² E04H *3/16, 3/18;* **F16L** *4/02*
U.S. Cl. 4—172.19 **1 Claim**



1. A learning pool for child swimmers comprising:

a. an elongated tank of a substantially U-shape in transverse cross section integrally formed with a bottom wall, side walls and end walls,

b. a continuous horizontal walkway extended laterally outwardly from the upper edge of said end walls and from one of said side walls,

c. each of said end walls comprised of a series of step members leading from said walkway to said bottom wall,

d. a combination cover and splash board assembly for said tank,

e. means pivotally connecting said combination assembly at one side thereof to the upper end of the other one of said tank side walls for pivotal movement to a first position extended upwardly and outwardly from said other tank side wall, and to a second horizontal position extended across said tank between the side walls thereof,

f. coacting means on said combination assembly and tank for limiting the pivotal movement of said combination assembly to said first position therefor, and

g. means on said tank one side wall engageable with the opposite side of said combination assembly to define said second position therefor.

3,971,077

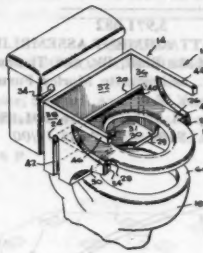
ADJUSTABLE HEIGHT CLOSET SEAT ASSEMBLY

Robert O'Neil, Wheaton, Ill., assignor to Beneke Division, Beatrice Foods Co., Columbus, Miss.

Filed Mar. 10, 1975, Ser. No. 557,168
Int. Cl.² A47K *13/00*
U.S. Cl. 4—239 **14 Claims**

1. A closet seat assembly providing the conventional position and an elevated position of the seat for use on the receptacle of a water closet with the closet seat tiltable rearwardly,

said seat assembly comprising a support structure, connecting means for attaching said support structure to the water closet, a closet seat having a central opening providing access to said receptacle, a means operatively connected between the seat and support structure for moving the closet seat from the



conventional position to the elevated position, means integral with the moving means for permitting the closet seat to be tilted rearwardly to provide easy access to the receptacle for cleaning and the like and a positioning means on the support structure for engagement with a portion of the closet seat to maintain said seat in the elevated position.

3,971,078

DEVICE FOR CHANGING THE POSITION OF THE HEAD SECTION OF HIDE-AWAY BED FRAMES

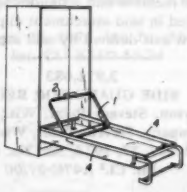
Jose Pardo Herrera, Carretera de Logrono, Km. 1, 7 Zaragoza, Spain

Filed Apr. 23, 1975, Ser. No. 570,835

Claims priority, application Spain, Apr. 30, 1974, 202693[U]

Int. Cl.[2] A61G *7/06*

U.S. Cl. 5—66 **5 Claims**



1. A position changing device for changing the position of a head section of a bed frame, wherein the bed frame comprises:

a bed frame; a first pivot axis on said bed frame; a head section pivotally attached to said bed frame at said first pivot axis; said first pivot axis being so oriented as to enable said head section to pivot toward and away from an orientation generally aligned with the orientation of said bed frame;

said position changing device comprising:

a slide bar rigidly attached to said head section; said slide bar extending in a direction that is generally along the length of said head section; said slide bar being spaced a distance from said head section; said slide bar extending past said pivot axis and extending along a path that is spaced a distance from said first pivot axis, whereby as said head section pivots about said first pivot axis, said slide bar both pivots around said first pivot axis along with said head section and moves longitudinally along the length of said slide bar itself with respect to said pivot axis;

a slide bar lock support attached to said bed frame; a slide bar lock that is supported on its said support; said slide bar lock including one side having a hole therethrough, through which said slide bar passes; said hole being defined by side walls in said slide bar lock one side and said hole being sized and shaped such that when said one side is at a first tilt orientation with respect to said slide bar, said slide bar can freely slide through said hole, but when said one side is at a second tilt orientation with respect to said slide bar, said hole side walls engage said slide bar and prevent movement thereof, thereby to halt movement of said head section;

first slide bar lock tilting means connected to said slide bar lock for tilting it to said first tilt orientation; second slide bar lock tilting means connected to said slide bar lock for tilting it to said second tilt orientation.

3,971,079

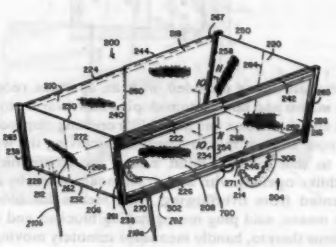
BABY HOLDING DEVICE

Henry Fleischer, 18 Notch Park Road, Little Falls, N.J. 07424

Division of Ser. No. 406,620, Oct. 15, 1973. This application Mar. 10, 1975, Ser. No. 556,554

Int. Cl.[2] B62B *9/12*; A47C *27/08*

U.S. Cl. 5—97 **25 Claims**



1. A collapsible portable baby holding device comprising a first section and a second section, each of said sections including a bottom wall for supporting a baby, a pair of side walls and at least one of said sections including an end wall, said first section being adapted to be longitudinally telescopically positionable within said second section with the bottom walls of each being in telescopingly overlapping or contiguous relationship, the side and/or end walls of each of said first and second sections including a vertically-disposed hinge for collapsing said end walls, and a pair of vertically-disposed hinges connecting each of said side and/or end walls to said side and/or end walls, respectively.

3,971,080

RECESSED BATHTUB

Irene D. Walker, 206 Sostes Drive, Cleveland, Miss. 38732

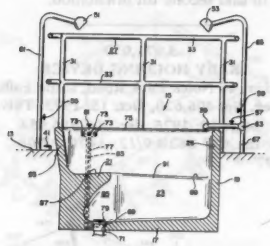
Filed Nov. 10, 1972, Ser. No. 305,489

Int. Cl.[2] A47K *3/00*, *3/04*

U.S. Cl. 4—173 R **1 Claim**

1. The combination with a bathroom having a floor, of a bathtub for facilitating the task of bathing and showering oneself selectively even though the user may be physically handicapped, said bathtub comprising a well including a bottom and having a first continuous wall encompassing said bottom and being tangentially disposed thereto, cresecent shaped bench means for supporting the user in a sitting position and for providing a step to accommodate ingress and egress of the user, a second continuous wall tangentially engaging said first wall and joining said bottom to said bench means, the diameter of said first wall being greater than the diameter of said second wall with the difference in diameters thereof defining said crescent shaped bench means, said bottom and said bench means being recessed below said floor and

said first wall extending a predetermined distance upwardly above the level of said floor for allowing said well to be of an optimum depth without requiring the user to step too far below the level of said floor, hand rail means for assisting the user into and out of said well and for providing a safety barrier thereabout, said hand rail means being disposed circumferentially about said well and supported a predetermined distance above said floor, means for controllably filling said well with water, shower head means supported a predetermined distance above said bottom and being communicated with said filling means, valve means for selectively interrupting the flow of water from said shower head means and said filler spout means, drain means for controllably disposing of the water,



said bottom being provided with an aperture receiving said drain means and said bottom sloping downwardly towards said drain means, at least one mouthlike opening disposed adjacent the upper edge of said first wall for receiving the water which rises to that level, conduit means for communicating said mouthlike opening with said drain means whereby said well is prevented from overflowing, plug means for blocking said drain means, said plug means having blocked and unblocked positions thereto, handle means for remotely moving said plug means between said blocked and unblocked positions, and linkage means for mechanically connecting said handle means to said plug means with said linkage means being received in said conduit means and extending from a position below the level of said floor to a position above the level of said floor.

3,971,081

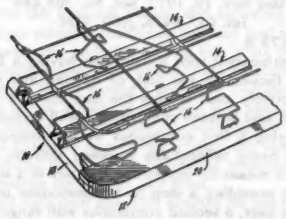
BOX SPRING UNIT WITH METAL SLATS

Richard C. Roe, Palatine, Ill., assignor to Sealy, Incorporated, Chicago, Ill.

Continuation of Ser. No. 451,170, March 14, 1974, abandoned, which is a continuation of Ser. No. 216,701, Jan. 10, 1972, abandoned. This application Nov. 25, 1974, Ser. No. 526,951

Int. Cl.[2] A47C *23/04*

U.S. Cl. 5—246 **4 Claims**



1. A frame for a box spring unit utilizing torsion bar springs comprising a generally rectangular wood frame member and a plurality of parallel transverse metal slats secured to said frame member, said slats having means to precisely position and firmly secure a torsion bar spring thereto, said metal slats providing the sole means of support for said torsion bar springs on said frame, said metal slats having an inverted U-shaped cross-section with leg portions extending downwardly, said leg portions having roll-back flanges extending upwardly along a part of said leg portions, said metal slats having a built-in crown.

3,971,082

SPRING ATTACHMENT ASSEMBLIES

Lawton H. Crosby, Lake Bluff, Ill., and Thomas H. Keane, Morristown, Tenn., assignors to Morley Furniture Spring Corporation, Chicago, Ill.

Filed Aug. 28, 1974, Ser. No. 501,155

Int. Cl.[2] F16F *3/00*; A61J *19/00*

U.S. Cl. 5—260 **4 Claims**

1. An attachment assembly for attaching a sinuous spring band to a steel rail in a furniture frame or the like wherein the rail comprises a horizontal flange and a vertical flange, comprising:

a. a pair of openings formed in said vertical flange in spaced relationship along the length of the flange,

b. each of said openings comprising a vertically elongated aperture formed through said vertical flange immediately adjacent said horizontal flange,

c. a generally u-shaped anchor link having a base leg seated against the back surface of said vertical flange and a pair of attachment legs extending through said vertically elongated apertures and normally resting on said upper surface of said horizontal flange,

d. the free ends of said attachment legs each having an attachment clip formed thereon substantially in alignment with the free edge of the horizontal flange whereby one of a link member and a sinuous spring band segment may be seated in said attachment clips and free to pivot about a pivot axis defined by said attachment clips.

3,971,083

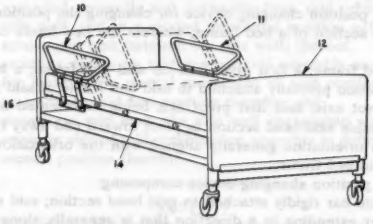
SIDE GUARD FOR BEDS

Warren J. Peterson, Stevens Point, Wis., assignor to Joerns Furniture Company, Stevens Point, Wis.

Filed Nov. 27, 1974, Ser. No. 527,522

Int. Cl.[2] A47C *21/00*

U.S. Cl. 5—331 **24 Claims**



1. A safety rail assembly for hospital beds comprising a safety rail; pivot means for supporting said rail and moving said rail between at least a raised position generally above the mattress of a bed and a lowered position generally below the said mattress; latch means for holding said safety rail in said raised position including release means extending from one end of said latch means for movement by a knee or other portion of a person's body to allow said pivotal movement of

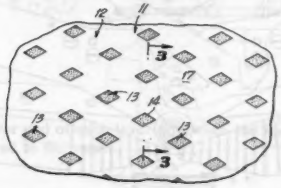
said rail between said positions, said release means avoiding the strict necessity of using only one's hand or hands to release the rail; and means for limiting pivotal movement of said rail to a pivotal direction away from said release means whereby said pivot means and rail are prevented from striking said person's knee or any other portion of a person's body used to operate the release means as said rail is raised or lowered.

3,971,084

HULL CONSTRUCTION AND METHOD FOR FORMING SAME

I. Martin Spier, 50 Park Ave., New York, N.Y. 10016

Filed Mar. 7, 1974, Ser. No. 449,188
Int. Cl.² B63B *5/24*
U.S. Cl. 9—6 P **16 Claims**



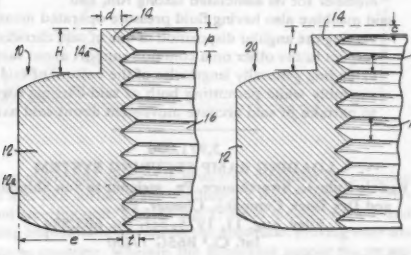
1. A hull construction formed of at least one fabricated layer defining the outer surface layer comprising a metal which inhibits the growth on or adherence to of marine life selected from the group consisting of copper and copper alloy, the metal defining a plurality of interstices on the outer surface; and plastic material being interleaved in said interstices defined by said metal to define an exterior surface which includes only said metal and plastic material.

3,971,085

LOCK NUT

Wadsworth W. Mount, 154 Mountain Ave., Warren, N.J. 07060

Filed Apr. 21, 1975, Ser. No. 569,770
Int. Cl.² B21D *53/24*
U.S. Cl. 10—86 A **5 Claims**



1. The method of making a lock nut, comprising the steps of:

a. forming a blank including a relatively thick walled annular body and a relatively thin walled annular collar concentric with and integral with the body and projecting from one end thereof, said blank having a continuously threaded bore extending axially through both the body and the collar, the threads in said bore having a substantially constant pitch, said collar having a wall thickness not less than about three-fourths and not greater than about one and one-half times the thread depth, said collar also having an axial length between one and three times the thread pitch;

b. compressing only the collar of said blank only axially, with the collar free of all lateral restraint except at its connection to the body, until the collar is stressed in compression beyond its elastic limit; and

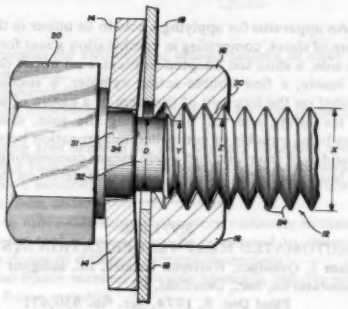
c. thereafter relieving the compression, said compressing and relieving steps cooperating to deform the collar by shortening it from about 0.1 to about 0.4 times the thread pitch, and by a tapered thickening of the collar so that its diameter decreases from its projecting end toward the body.

3,971,086

METHOD OF FABRICATING A FASTENER ASSEMBLY

Peter P. Stanaitis, Rockford, Ill., assignor to Textron, Inc., Providence, R.I.

Division of Ser. No. 443,136, Feb. 14, 1974, Pat. No. 3,913,649. This application July 16, 1975, Ser. No. 596,320
Int. Cl.² B23P *19/08*; B21H *3/02*
U.S. Cl. 10—155 A **2 Claims**



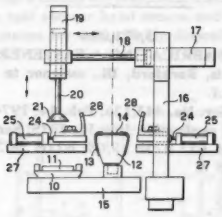
1. A method of fabricating an externally threaded fastener unit of the type designed for mating engagement with an internally threaded element; said fastener unit being of the type which includes, a screw member having a head portion and an elongate shank, which shank has a threaded portion and an unthreaded portion disposed intermediate said head portion and said threaded portion, and an apertured, frusto-conical washer carried on said screw member, proximate the unthreaded portion thereof with the major diameter of said screw thread being greater than the minimum dimension of said washer aperture to maintain said washer in assembled relation thereon; said method comprising the steps of: providing a headed blank having an elongate shank, which includes, a first axial segment remote from said head and having a predetermined cross-sectional dimension, and a second axial segment immediately adjacent said first segment and of a lesser cross-sectional dimension, said second section being disposed intermediate said blank head and said first section; providing an apertured frusto-conical washer, said aperture having a minimum internal dimension greater than the cross-sectional dimension of said first shank segment; positioning said washer on said shank proximate said blank head; cold forming an external screw thread on said first shank segment only to produce a thread form having a major cross-sectional dimension greater than that of said washer aperture; and said step of forming including, the step of controlling the dimension of said external thread form such that the cross-sectional dimension of said second shank segment will be less than the minimum minor diameter of an internal thread designed in accordance with industry specified dimensions and tolerances for mating engagement with said external thread.

3,971,087

APPARATUS FOR APPLYING A SOLE TO AN UPPER IN THE MANUFACTURE OF SHOES

Antonio Giordano, Florence, Italy, assignor to Viges S.p.A., Vigevano (Pavia), Italy

Filed Nov. 11, 1974, Ser. No. 522,830
Claims priority, application Italy, Nov. 22, 1973, 31642/73
Int. Cl.[2] A43D 89/00
U.S. Cl. 12—1 A 5 Claims



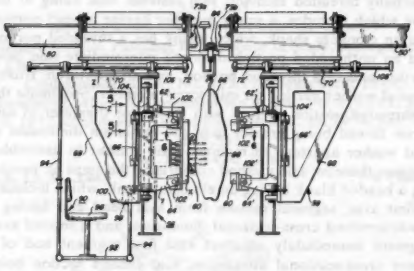
1. An apparatus for applying a sole to an upper in the manufacture of shoes, comprising in combination a seat for containing a sole, a shoe last adapted to receive an upper completed with insole, a first double-acting cylinder, a suction means mounted on the free end of the stem of a piston of said cylinder, for lifting and for transporting the sole, said suction means being capable of controlled reciprocation between said seat and said shoe last, and guide means cooperating with the shoe last to guide the sole to a position centered on the upper.

3,971,088

AUTOMATED MEAT TENDERIZATION SYSTEM

William J. Osiadacz, Hoffman Estates, Ill., assignor to Baxter Laboratories, Inc., Deerfield, Ill.

Filed Dec. 9, 1974, Ser. No. 530,671
Int. Cl.[2] A22C 9/00
U.S. Cl. 17—25 22 Claims



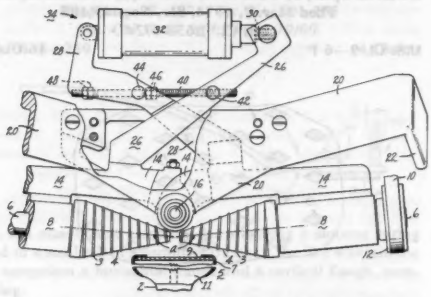
1. In a meat tenderizing system in which a tenderizing solution is injected into a carcass after slaughter at a tenderizing station, the improvement comprising, in combination: a carriage assembly carrying a needle manifold with a plurality of generally parallel injection needles for injecting tenderizing solution into the carcass; an overhead conveyor system for conveying the carcass to the tenderizing station along a path transverse to the axes of said injection needles; means for selectively moving the carriage assembly in at least two directions to position the injection needles relative to the carcass; and means for automatically injecting and withdrawing said needles into and out of said carcass.

3,971,089

SELF-ADJUSTING ROLL WIPERS FOR A SHOE LASTING MACHINE

Ronald O. C. Gadd, Leicester; Robert C. Quarmby, Groby, and Frank R. Smith, Leicester, all of England, assignors to USM Corporation, Boston, Mass.

Filed Apr. 3, 1975, Ser. No. 564,673
Claims priority, application United Kingdom, May 7, 1974, 20175/74
Int. Cl.[2] A43D 21/00
U.S. Cl. 12—8.3 5 Claims



1. A shoe upper conforming machine for simultaneously lasting opposite side portions of shoes in at least the waist region thereof, said machine comprising:

a pair of lasting rolls which are arranged to operate simultaneously to wipe marginal portions of an upper at opposite sides of a shoe assembly inwardly over the last bottom;

said rolls being relatively movable lengthwise of a shoe to cause the rolls progressively to operate along side portions of a shoe assembly;

each of said lasting rolls being supported by a roll carrying means so that axes about which said rolls rotate extend at least substantially widthwise of any shoe assembly being operated upon, wherein each of said roll carrying means is capable of individual programmable arcuate movement about an axis extending generally lengthwise of the bottom of said shoe assembly;

each of said rolls having a carrier provided with a bearing member for its associated lasting roll; and

said machine also having fluid pressure operated means for varying the angular disposition of one of said carriers with respect to the other on a common support about said axis extending generally lengthwise of the bottom of said shoe assembly while permitting both of said carriers together to partake of said arcuate movement about said axis.

3,971,090

LOADING RAMP SECURING SYSTEM

Radoje Vulovic, Swarthmore, Pa., assignor to Sun Shipbuilding and Dry Dock Company, Chester, Pa.

Filed Aug. 11, 1975, Ser. No. 603,884
Int. Cl.[2] B65G 11/00
U.S. Cl. 14—71.3 12 Claims

7. Apparatus for flexibly coupling a loading ramp to a vessel and comprising:

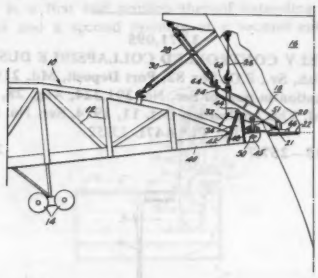
a. a vessel having a deck onto which cargo is to be loaded and unloaded;

b. a loading ramp having a vessel end adapted to be secured to the vessel;

c. first and second lever arms pivotally connected on opposite sides of the vessel end of said loading ramp, each lever arm being pivotally connected to the loading ramp at a location along the length of each lever arm between vessel and pier ends of the lever arm;

d. said vessel having means for supporting the vessel end of each lever arm at substantially the deck height of the vessel;

e. said vessel further including means for hangingly supporting the pier end of each lever arm from a location above



the pier end of each lever arm when the loading ramp is secured to the vessel.

3,971,091

AUTOMATIC APPARATUSES, ROBOTS AND THE LIKE

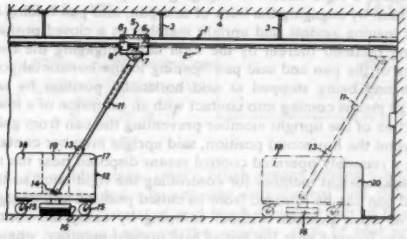
Karl Gunnar Magnus Perén, Saltsjobaden, and Stig Åke Gösta Svensson, Sodertalje, both of Sweden, assignors to AB Profila, Norrkoping, Sweden

Filed May 29, 1974, Ser. No. 474,339

Claims priority, application Sweden, May 30, 1973, 7307708

Int. Cl.² A47L *11/22*

U.S. Cl. 15—49 R 3 Claims



1. An automatic apparatus primarily intended for cleaning floors and like surfaces and including a motor-actuated driving and steering unit, a guide track, a rod means, a yoke, and cleaning implements carried by the apparatus moving over the surface in question, wherein the apparatus proper for its advance is coupled with said motor-actuated driving and steering unit which is spaced from the machine proper and adapted to travel along said guide track which is spaced from the floor or like surface, said driving and steering unit and the apparatus proper connected by said yoke pivotally mounted to the apparatus and said rod means comprising one rod rigidly connected with said yoke and another rod mounted for swinging movement at said driving and steering unit, the length of said rod means being so dimensioned that said rod means will occupy a position inclined forwardly in the direction of travel, and said rod means being of the telescoping type to permit said driving and steering unit to move in the opposite direction of travel over and past the apparatus proper to a position in which said extended telescoping rod again tows the apparatus.

3,971,092

APPARATUS FOR CLEANING THE SEALING SURFACES OF COKE OVEN DOORS AND DOOR JAMBS

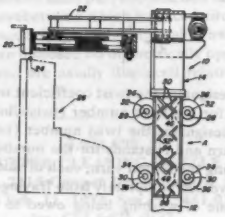
Walter Stanke, and Gottfried Mertens, both of Essen, Germany, assignors to Heinrich Koppers Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Aug. 28, 1974, Ser. No. 501,298

Claims priority, application Germany, Dec. 1, 1965, 2345212

Int. Cl.² C10B *43/04*

U.S. Cl. 15—93 A 7 Claims



1. Apparatus for cleaning the sealing surface of coke oven doors comprising,

a frame member,

a support structure movably mounted on said frame member,

a cleaning tool secured to said support structure and extending forwardly therefrom, said cleaning tool arranged to move horizontally and clean a horizontal surface of a coke oven door,

means to move said support structure vertically so that said cleaning tool is operable to be positioned to clean coke oven doors of different vertical dimensions,

a second frame member movable vertically relative to said first frame member,

said second frame member having a support member extending forwardly therefrom,

a rotary column secured to said support member extending forwardly from said second frame member,

pairs of second cleaning tools secured to said rotary column and extending outwardly therefrom,

said second cleaning tools spaced at different dimensions from said rotary column, and

said second cleaning tools operable to move vertically and selectively clean the vertical sealing surface of coke oven doors having different transverse dimensions.

3,971,093

MOP HAVING A WASHING RESISTANCE

Toshiyoshi Komatsu, Osaka, and Keizo Chimura, Toyonaka, both of Japan, assignors to Duskin Franchise Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 180,141, Sept. 13, 1971, abandoned. This application Oct. 25, 1973, Ser. No. 409,455

Int. Cl.² A47L *13/17, 13/20;* D02G *3/36*

U.S. Cl. 15—104.93 2 Claims

1. A mop having an excellent washing resistance, which comprises a fibrous substrate and piles fixed on said fibrous substrate, each of said piles having an apparent diameter ranging from 2 to 10 mm. and a length of 3 to 30 cm. as measured from the cut end point to the point fixed on the substrate; wherein each of said piles is obtained by subjecting a yarn composed of a loosely twisted fold yarn of a plurality of thick single yarns of cotton fibers or a mixture of at least 70% by weight of cotton fibers with up to 30% by weight of artificial fibers, to the mercerizing treatment substantially under no tension under such conditions that the yarn is contracted by 10 to 30% in the longitudinal direction, said starting yarn having a single yarn twist coefficient of 3 to 4 as calcu-

lated from the following formula

$$K = \frac{t_1}{\sqrt{S}}$$

wherein K designates the twist coefficient of the single yarn, t_1 stands for the twist number (twists/inch) of the single yarn and S designates the number of the count of the single yarn,

and having a folded yarn twist coefficient of 1 to 2 as calculated from the following formula

$$f = \frac{t_2}{t_1} \times \sqrt{N}$$

wherein f designates the twist coefficient to the folded yarn, t_1 stands for the twist number (twists/inch) of the single yarn, t_2 designates the twist number (twists/inch) of the folded yarn and N stands for the number of single yarns constituting the folded yarn; each of said piles is substantially prevented completely from fraying from the cut end at the time of washing being owed to said mercerizing treatment; and wherein the mop is impregnated with 10 to 30% by weight, based on the mop, of an oil composition comprising as the main ingredient a non-drying mineral oil and containing 0.5 to 20% by weight bases on the total oil composition, of a catonic surfactant or a combination of a catonic surfactant and a non-ionic surfactant.

3,971,094

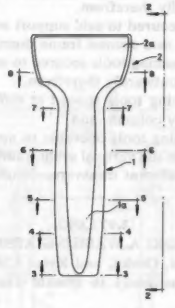
BRUSH HANDLES

Johannes Solf, Lindenstr. 39, 7031 Aidlingen, and Wolfgang Feine, Simoniussteige 16, 7988 Wangen, Allgau, both of Germany

Continuation-in-part of Ser. No. 350,938, April 13, 1973, abandoned. This application Dec. 12, 1974, Ser. No. 532,203

Int. Cl.² A46B *5/02*

U.S. Cl. 15—143 R **2 Claims**



1. A brush handle which is proportioned to be of a length not substantially greater than an average adult hand width, said handle having two opposed convexly shaped sides which extend between opposite handle ends and arched in opposite directions to provide a maximum width approximately midway of the handle, a second pair of convex sides arched in opposite directions and proportioned to provide a maximum dimension approximately midway of the handle in length, such pair of opposed sides being joined by edges running in the direction of the axis of the handle length and adapted to form an eight cornered cross-sectional shape providing a ball-like configuration whereby substantially uniform pressure distribution is effected between the grip of the user and the confronting surfaces of the handle, recess means forming a contact surface for the thumb at that end of the handle forming a tool-mounting shank to absorb torque produced through the laterally off-set resultant forces which are non-collinear with the longitudinal axis of the handle, and trapezoidal flattened portions flaring in the direction of the brush end of said handle and disposed at the end of said handle which forms the base of the handle.

3,971,095

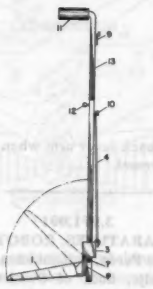
REMOTELY CONTROLLED COLLAPSIBLE DUST PAN

Paul R. Fish, Sr., P.O. Box 82, Port Deposit, Md. 21904

Continuation-in-part of Ser. No. 391,324, Aug. 28, 1973, abandoned. This application Oct. 11, 1974, Ser. No. 514,242

Int. Cl.² A47L *13/52*

U.S. Cl. 15—257.7 **2 Claims**



1. A collapsible dust pan combination consisting of an upright member with a holding means located at the upper end of said upright member extending at substantially a 90° angle with respect to said upright member; a pan having a back, sides and bottom connected to the lower portion of said upright member through a hinge, said holding means extends in the same direction as said pan when said pan is in an open position; a rigid latch for engaging said pan in a horizontal position by engaging the back of said pan, said pan folding up and leaning against said upright member in a closed position being retained therein by the rigid latch engaging the front edge of the pan and said pan opening to the horizontal position and being stopped at said horizontal position by said hinge means coming into contact with an extension of a lower portion of the upright member preventing the pan from going beyond the horizontal position, said upright member containing a remotely operated control means disposed near the top of said upright member for controlling the rigid latch so that said pan can be released from its closed position and engaged in its open position without stooping by using the control means located near the top of said upright member, wherein said upright member is a shaft.

3,971,096

VACUUM CLEANER, OPERATED BY COMPRESSED AIR

Arnkjell Renholt, Sandefjord, Norway, assignor to A/S Norclean, Sandefjord, Norway

Filed May 23, 1974, Ser. No. 472,822

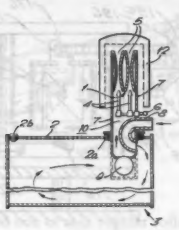
Claims priority, application Norway, May 25, 1973, 2154/73

Int. Cl.² A47L *9/00, 5/18*

U.S. Cl. 15—326 **6 Claims**

1. A pressurized air-operated vacuum cleaner apparatus having an ejector device with nozzle means and appurtenant venturi means for creating a vacuum in an oil drum type container, said ejector device including an inlet passage for conducting suction air and entrained debris from a location outside said container into said container and an outlet passage for conducting air from said container, said nozzle means being mounted in said outlet passage upstream from said venturi means, means for supplying high pressure operating

air to said nozzle means for ejection thereof downstream into said venturi means to produce said vacuum, said container including an open plug hole and a closed plug hole, the improvement comprising, an elongated housing enclosing said ejector device and being mounted with a sealing fit through said open plug hole, said elongated housing including a first opening in a first end portion thereof extending into said container and a second opening at a second end portion



thereof extending outwardly of said container, said elongated housing further including a third opening adjacent said first opening and a fourth opening in a side wall of said elongated housing outside of said container, said outlet passage extending between said first and second openings and said inlet passage extending between said third and fourth openings.

2. Apparatus as in claim 1 further comprising a muffler mounted over said second opening of said elongated housing.

3,971,097

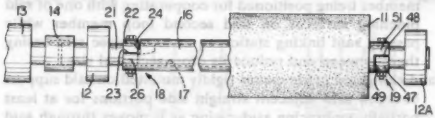
CYLINDRICAL BRUSH WITH STUB SHAFT SUPPORT

Gaylord J. Clark, 4679 Paw Paw Lake Road, Coloma, Mich. 49038

Continuation-in-part of Ser. No. 510,751, Sept. 30, 1974, Pat. No. 3,921,245. This application Aug. 21, 1975, Ser. No. 606,659

Int. Cl.² A46B *13/02*

U.S. Cl. 15—179 **14 Claims**



1. In combination, rotary brush means having a sleeve-like hub provided adjacent one end thereof and defining therein a bore coaxial of said brush means, a pair of bearing means positioned ajacent the opposite ends of said rotary brush means, and shaft means connected between said rotary brush means and said pair of bearing means for supporting said brush means for rotation about a rotational axis defined by said bearing means, said shaft means including a stub shaft connecting means connected to said hub and coacting with an adjacent one of said bearing means, said connecting means including a stub shaft having a first shaft portion rotatably supported within said one bearing means and a second shaft portion spaced from said first shaft portion and positioned within said bore and fixedly connected to said hub, comprising the improvement wherein said stub shaft connecting means includes first means defining a recess within said hub and extending axially inwardly a first preselected distance from the free end thereof, said recess extending circumferentially of said hub through an angle of at least approximately 180°, said second shaft portion including a first shaft part disposed within said hub and extending axially throughout said first preselected distance, said hub and said first shaft part having a first clamping area therebetween which is spaced diametrically opposite from said recess, said second shaft portion including a second shaft part disposed directly adjacent said first shaft part and defining the free end of said stub shaft, said second shaft part extending inwardly into said hub for a second preselected distance beyond said first preselected distance, and second means associated with said hub and said second shaft part for creating a clearance space therebetween which extends axially of said hub throughout at least said second preselected distance, said clearance space extending circumferentially of said hub through an angle of at least approximately 180°, said clearance space being diametrically opposite but axially spaced from said recess whereby said stub shaft and said hub can be relatively angularly displaced about a pivot axis which is substantially perpendicular to the rotational axis, said second shaft part and said hub having a second clamping area therebetween which is spaced circumferentially from said clearance space, whereby said first and second clamping areas are disposed on diametrically opposite sides of said stub shaft and are axially displaced relative to one another.

3,971,098

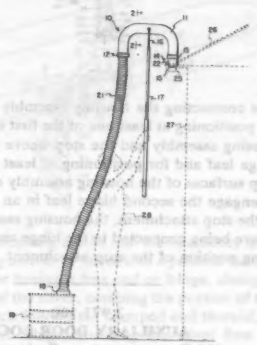
GUTTER CLEANING NOZZLE

Donald E. Davis, 2115 Cowper Drive, Raleigh, N.C. 27608

Filed Feb. 11, 1974, Ser. No. 441,019

Int. Cl.² A47L *9/32*

U.S. Cl. 15—410 **5 Claims**



1. A gutter and roof cleaning nozzle system for use with wet/dry vacuum devices comprising: an integral nozzle manifold; a special purpose nozzle head operatively connected to one end of said manifold whereby debris and other foreign matter can be readily contacted; a continuous, non-telescoping flexible hose means operatively connected at one end to the end of said manifold opposite said nozzle head and at its other end to the wet/dry vacuum source to allow for passage of debris therebetween; and an elongated telescopic handle means supportingly attached to said manifold to allow the height of the nozzle above the ground to be adjusted and the same can be manipulated into operative debris removing position.

3,971,099

HINGE ASSEMBLY STOP ATTACHMENT

David L. Wallace, 2924 Cresent Drive, Stillwater, Okla. 74074

Filed June 23, 1975, Ser. No. 589,055

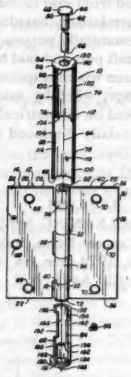
Int. Cl.² E05F *3/20*

U.S. Cl. 16—50 **17 Claims**

1. A stop attachment removably connectable to a hinge assembly having a first hinge leaf, a second hinge leaf and a pintle hingedly connecting the first hinge leaf and the second hinge leaf for pivotal movement of the first and the second hinge leaves about the pintle connection therebetween, comprising:

a housing assembly having a first stop surface and a second stop surface formed on portions thereof, and a portion removably connectable to the hinge assembly;

a stop sleeve having a first stop surface and a second stop surface formed on portions thereof, and a portion removably connectable to the hinge assembly; and



means connecting the housing assembly to the stop sleeve for positioning at least one of the first stop surfaces of the housing assembly and the stop sleeve to engage the first hinge leaf and for positioning at least one of the second stop surfaces of the housing assembly and the stop sleeve to engage the second hinge leaf in an operating position of the stop attachment, the housing assembly and the stop sleeve being connected to the hinge assembly in the operating position of the stop attachment.

3,971,100

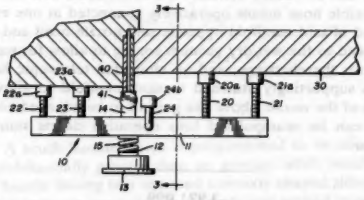
AUXILIARY DOOR LOCK

Ivan Anop, 639 Tuscarawas Ave., Barberton, Ohio 44203

Continuation-in-part of Ser. No. 474,517, May 30, 1974, abandoned. This application Mar. 6, 1975, Ser. No. 555,863

Int. Cl.² E05F 5/02

U.S. Cl. 16—82 **7 Claims**



1. An auxiliary lock for use in connection with a door hinge, comprising;

A. an elongate cross bar;

B. a plurality of adjustable stop members carried by and projecting from one side of said cross bar; and

C. spring-loaded connecting means

1. carried by said cross bar between said stop members and

2. adapted to engage the door hinge and normally urging said cross bar toward the door hinge.

3,971,101

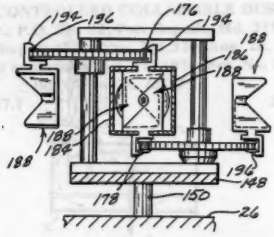
APPARATUS FOR ENCASING A PRODUCT

Ray T. Townsend, and Donald L. Beasley, both of Des Moines, Iowa, assignors to Townsend Engineering Company, Des Moines, Iowa

Filed Oct. 2, 1972, Ser. No. 294,214

Int. Cl.² A22C 11/00

U.S. Cl. 17—33 **2 Claims**



1. Linking apparatus for use with a product encasing machine, said machine being adapted to expel an elongated casing filled with plastic product and being adapted to rotate said casing about its longitudinal axis; said linking apparatus comprising,

a support;

first and second sets of drive wheels rotatably mounted on said support;

means for rotating said drive wheels;

first and second loop members trained around said first and second sets of drive wheels respectively;

said first and second loop members having adjacent straight side portions defining a linking station;

said wheels being adapted to move said loop members past said linking station adjacent said casing;

a plurality of pinching members having pinching surfaces thereon carried around said first and second sets of drive wheels by said first and second loop members respectively, each of said pinching surfaces on said first loop member being positioned for cooperating with one of said pinching surfaces on said second loop member while passing said linking station so as to collapse said casing therebetween and reduce its cross-sectional size;

and elongated guide means rigidly mounted on said support between said adjacent straight side portions for at least partially embracing said casing as it moves through said linking station;

said pinching surfaces of said pinching members being received by said guide means and moving through said guide means as said casing moves through said linking station;

said elongated guide means extending substantially the entire length of said adjacent straight side portions for guiding said casing for substantially the entire time said casing is moving through said linking station.

3,971,102

SHRIMP PEELER ROLLER SYSTEM

Raphael Q. Skrmetta, 4610 Press Drive, New Orleans, La. 70126

Filed Nov. 7, 1974, Ser. No. 521,785

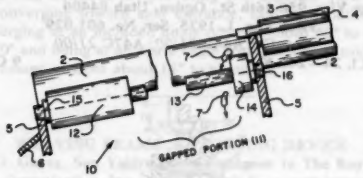
Int. Cl.² A22C 29/00

U.S. Cl. 17—73 **9 Claims**

1. The method of varying the effective peeling action of a shrimp peeling machine which peels shrimp by the action of at least two regular, mating rollers rotating in alternating, opposite directions forming a peeling section, the shrimp being supported on the rollers and being peeled by the rollers by means of the shells being pinched between the nips of the rollers as the shrimp move down the rollers, comprising the following steps:

a. providing at least one supplemental roller having an initial portion along its length of the same diameter as one

of said regular mating rollers and a subsequent gapped portion of a reduced diameter further down along its length of a size sufficient for all the shrimp to fall into without encountering any further peeling action when the shrimp is at said gapped portion to allow all the shrimp being peeled to then fall out of the peeling section and avoid any further peeling action; and



b. replacing said one of said regular rollers with said supplemental roller with said initial portion at the upstream end and in peeling engagement with the other of said regular rollers and said gapped portion being out of any peeling engagement with said other regular roller; whereby the effective peeling action of the machine is shortened by means of all of the shrimp falling into said gapped portion rather than being subject to peeling action along the full length of the rollers.

3,971,103

SAFETY DEVICE FOR STOPPING THE BALE PLUCKING OPERATION

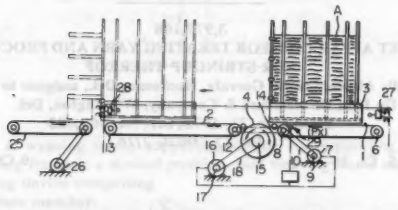
Kazuyoshi Ono, Chiryu; Osamu Suzuki, Kariya, and Hideo Hidaka, Aichi, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Japan

Filed June 6, 1974, Ser. No. 476,792

Claims priority, application Japan, June 13, 1973, 48-69637[U]

Int. Cl.² D01G *31/00, 7/00*

U.S. Cl. 19—.2 **6 Claims**



1. A bale plucker for plucking fiber tufts from a highly compressed fiber bale by a plucking roller which is constructed to remove fibers with each reciprocating passage of said bale from the bottom of said bale, comprising conveying means for reciprocally shifting said fiber bale in a predetermined path to and from a working position of the plucking roller, driving mechanism for driving said reciprocally shifting device and for driving said plucking roller, an electric circuit which connects said driving mechanism to an electric source, and a safety device for stopping the bale plucking operation of said bale plucker, a device for detecting the existence of metallic substances which are contained in said fiber bale, said detecting device being disposed at a position adjacent said predetermined path of said carrying device and being positioned adjacent to the reciprocal shifting path of said bale to detect the existence of the metallic substance within an effective thickness of said bale from said conveying means, an electromagnetic relay arranged in said electric circuit, said electromagnetic relay being capable of actuation by an electric signal issued from said detecting device, whereby, when a portion of said fiber bale, which contains a metallic substance approaches an effective position of said detecting device according to the plucking operation and therefore said detecting device detects a metallic substance contained in said fiber bale before said bale is carried to said working position of said plucking roller, means connected for actuation of said electromagnetic relay by said signal issued from said detecting means so that said driving mechanism is stopped and displacement of said fiber bale to said working position of said plucking roller is prevented, and supplemental conveyor means adjacent said reciprocating path, to which said bale may be diverted after said driving mechanism is stopped.

3,971,104

TEXTILE FIBER COMBING

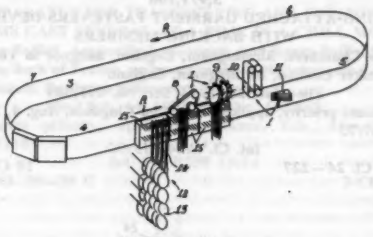
Derek W. F. Turpie, and Jaroslav Klazar, both of Port Elizabeth, South Africa, assignors to South African Inventions, Pretoria Transvaal, South Africa

Filed Aug. 13, 1974, Ser. No. 497,100

Claims priority, application South Africa, Aug. 14, 1975, 73/5552

Int. Cl.² D01G *19/10*

U.S. Cl. 19—115 R **19 Claims**



1. A method of combing textile and the like fibres including the steps of feeding a sliver of fibres into a position suitable for combing, said sliver having a free end or fringe, clamping the free end or fringe of the sliver, combing the portion of the thus clamped sliver which follows the clamped end thereof, releasing the free end or fringe, combing the sliver free end or fringe, the sliver thereby having uncombed a portion which adjacently follows the combed portion, combing said uncombed portion of the fibres adjacent and following the combed portion of the fibres, drawing off fibres from the thus combed sliver, and advancing the sliver for repetition of the cycle.

3,971,105

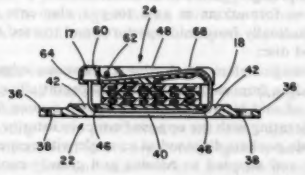
MOUNT FOR FLAT OBJECTS SUCH AS FLAT CABLES

Jack E. Caveney, Hinsdale, Ill., assignor to Panduit Corporation, Tinley Park, Ill.

Filed Jan. 8, 1975, Ser. No. 539,373

Int. Cl.² B65D *63/00*

U.S. Cl. 24—16 PB **21 Claims**



1. A mount for use with a cable tie having a locking head and a strap extending therefrom for holding at least one flat

cable having opposed generally flat first and second sides, said mount comprising:

a first member comprising means for providing a substantially flat surface for engaging the first side of said flat cable and further having guide means for guiding said strap about a portion of said first member so that said strap extends beyond said substantially flat surface; and

a second member having holding means for captively holding the locking head and having means for providing a substantially flat surface for engaging the second side of said flat cable and further having guide means for guiding said cable tie about a portion of said second member so that said cable tie extends beyond the last-mentioned substantially flat surface, said substantially flat surfaces being positionable facing each other and in substantial registration with each other whereby after the locking head is positioned in the holding means and the strap is positioned in the respective guide means of the first member and the second member, respectively, the flat cable can be inserted between said flat surfaces and the strap inserted through the locking head and tightened thereby to firmly hold said flat cable without substantial deformation thereof.

3,971,106

PRONG-ATTACHED GARMENT FASTENERS DEVICES WITH BACKING MEMBERS

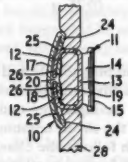
Brian Chambers, Birmingham, England, assignor to Thomas Walker Limited, Birmingham, England

Filed July 23, 1974, Ser. No. 491,089

Claims priority, application United Kingdom, Aug. 4, 1973, 37127/73

Int. Cl.[2] A44B *13/00*

U.S. Cl. 24—227 **10 Claims**



1. In a pronged garment fastener and backing member combination, a backing member comprising:

a. a sheet-metal disc constituting a body portion including a spherically curved shallow dished configuration having a convex exterior surface and a concave interior surface with a recess provided by the concavity of said concave interior surface;

b. tongue elements provided by diametrically opposed integral lugs extending radially inwards from the periphery towards the center of the disc;

c. said tongue elements lying within said recess and disposed at an angle with respect to each other;

d. apertures in said tongue elements to register with prongs of the pronged garment fastener; and

e. groove formations in said tongue elements extending longitudinally from said apertures and toward the center of said disc;

f. said tongue elements having continuous edge portions extending from said periphery in substantially close proximity of said interior surface and said groove formations co-operating with the opposed concave interior surface to provide pockets disposed at an angle with respect to each other and adapted to receive and closely confine outer end portions of the prongs and promote a flat surface contact between the prongs and said interior surface;

g. securing the fastener to garment material, said prongs being forced through the garment material so as to pass into said apertures and to be deflected into said pockets by forcible engagement with the opposed said concave interior surface of the disc and thereby to be clenched causing the outer end portions to be bent over the tongue elements at said apertures.

3,971,107

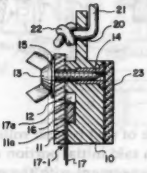
DEVICE FOR HOLDING FLEXIBLE MATERIAL

George Yim, 950 16th St., Ogden, Utah 84404

Filed Aug. 1, 1975, Ser. No. 601,029

Int. Cl.[2] A44B *21/00*; A47C *21/00*

U.S. Cl. 24—243 K **9 Claims**



1. A device for holding flexible sheet or strip material, comprising a loop holder formed by clamping jaws disposed in face-to-face relationship and having confronting faces configurated to provide a polygonal passage therebetween for the reception of a loop portion of flexible sheet or strip material to be held and of a loop-expanding element; jaw face portions adjacent to and at one end of the polygonal passage adapted to define therebetween a relatively shallow passage for said sheet or strip material when the clamping jaws are opened, said passage accommodating emergent portions of a received loop portion of flexible sheet or strip material to be held; means for applying clamping pressure to the clamping jaws of the loop holder; and a rigid, polygonal, loop-expanding element of size adapted to be non-rotatively accommodated by said polygonal passage and adapted for positioning within a loop portion of flexible sheet or strip material to be held that is positioned within said polygonal passage.

3,971,108

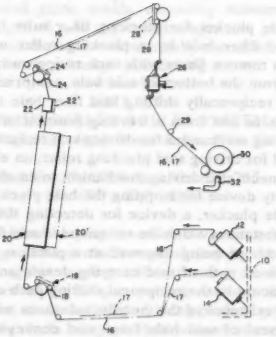
SET APPARATUS FOR TREATING YARN AND PROCESS FOR STRINGUP THEREOF

Adly Abdel-Moniem Gorrafa, Hockessin, Del., assignor to E. I. Du Pont De Nemours & Company, Wilmington, Del.

Filed Mar. 31, 1975, Ser. No. 563,403

Int. Cl.[2] D02G *1/16*

U.S. Cl. 28—1.4 **9 Claims**



1. A jet apparatus for treating yarn comprising:

a body member having a surface with a yarn passage in said surface extending from an entrance to an exit, said yarn passage having a semi-circular cross section;

a conduit within said body member intercepting said passage for introducing fluid into said passage;

a removable cover enclosing said passage;

and guide means located in each quadrant of the semi-circle of said passage cross section and positioned with relation to said entrance for providing two separate yarn paths converging toward said entrance, said yarn paths converging at an included angle of from about 60° to about 90° and being at an acute angle with the axis of said yarn passage of from about 15° to about 60°.

3,971,109

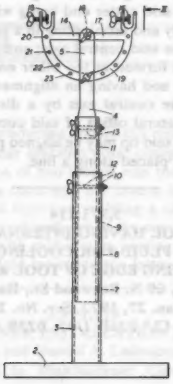
WEAVING FRAME SUPPORTING DEVICE

Jose G. Garza, San Ysidro, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Feb. 10, 1975, Ser. No. 548,336

Int. Cl.² D03D *29/00*

U.S. Cl. 28—15 2 Claims



1. A weaving frame supporting device for supporting a weaving frame in a desired position, said weaving frame supporting device comprising

a base member;

a support member of adjustable variable length supported substantially vertically by the base member, said support member having an axis;

a bifurcated head member adjustably affixed to the free end of the support member and having a pair of spaced substantially parallel arms; and

a clamp member rotatably adjustably affixed to and between the arms of the head member and having clamping means thereon for releasably clamping a weaving frame thereto in a manner whereby the clamping member is adjustable angularly in a plane through the axis of the support member to position the clamping means at selected angles relative to horizontal, said clamp member comprising a substantially linear member rotatably affixed at its center between the arms of the head member at upper points between said arms and a substantially semicircular member affixed to the linear member to form a substantially D shape having a plurality of spaced holes formed therethrough and affixed at a selected one of the holes to lower points between said arms.

3,971,110

METHOD FOR FABRICATING AN ELECTRON-EMISSION CATHODE

Richard E. Thomas, Riverdale, Md., and George A. Haas, Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 11, 1975, Ser. No. 612,517

Int. Cl.² H01J *9/12*

U.S. Cl. 29—25.18 16 Claims

1. A method for fabricating a thermionic cathode comprising:

uniformly mixing a quantity of noble metal powder with a quantity of silver powder;

compressing said mixture under pressure to form a shaped article;

sintering said article at a temperature sufficient to evaporate said silver and form a porous matrix; and

impregnating said matrix with an active material to fill the matrix pores and form an electron-emissive cathode, said active material consisting of at least one material selected from the group Ba, Ca and Sr.

3,971,111

APPARATUS FOR TRANSFERRING AND FINISHING ITEMS CAST SEVERAL AT A TIME IN A CHILL MOLD

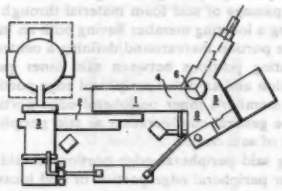
Andre Ballini, Arnouville-les-Gouesse, and Roger Bailly, Mendou, both of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Feb. 14, 1974, Ser. No. 442,649

Claims priority, application France, Feb. 14, 1973, 73.05210

Int. Cl.² B23P *15/10*

U.S. Cl. 29—38 C 7 Claims



1. Apparatus for transferring and finishing parts cast several at a time in a chill-mold which comprises:

first means for transferring parts from the casting machine a cooling conveyor which is connected to receive said parts from said first means and which is connected to deliver said parts to a second transferring means; said cooling conveyor comprising:

a frame on which is mounted a series of inclined chutes which comprise parallel bars down which said parts are slidable, a plurality of rows of cooling-fluid sprayers and a hood for drawing off fumes above the chutes a vibrator means on said frame for facilitating the movement of said parts;

a turntable onto which said parts are mounted in turn from said second transferring means for machining upon passage before turning means and broaching means; and

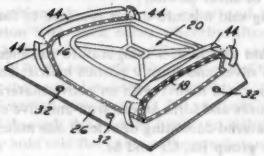
two pivoting levers positioned at the lower end of each of said chutes, said levers separated angularly and joined to a common axis and actuated by a jack, said levers further being separated axially by a distance corresponding to one of the dimensions of said part, said levers utilized for the retention of a stack of said parts and for the release of one of said parts to said second transfer means.

3,971,112

METHOD OF MAKING A COVERED ARTICLE

Frank M. Amato, Detroit, and Richard E. England, Birmingham, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sept. 22, 1975, Ser. No. 615,640
Int. Cl.² B68G 7/00
U.S. Cl. 29—91.1 9 Claims



1. A method of making a covered article which comprises the steps of:

forming at least a pair of covering members of a covering material, said covering material being impervious to a foam material which is formed from a foamable composition;

sewing said covering members together along at least one sew line to form a cover having a peripheral edge portion therearound and an interior volume, said sewing operation placing openings through said cover which permit the passage of said foam material through said cover;

forming a locating member having both an inner peripheral edge portion therearound defining a central opening and locating portions between said inner peripheral edge portion and an outer peripheral edge portion, said locating member's inner peripheral edge portion having the same general configuration as said peripheral edge portion of said cover;

joining said peripheral edge portion of said cover to said inner peripheral edge portion of said locating member;

sealing said opening along said sew lines joining said covering members together so that said foam material produced upon foaming of said foamable composition cannot flow through said openings;

locating said cover and joined locating member in a foaming mold having a mold portion containing a die surface upon which a vacuum can be drawn and an openable cover portion, said locating portions of said locating member being aligned with locating positions on said foaming mold to align accurately said cover with said die surface of said foaming mold;

drawing a vacuum on said die surface of said foaming mold thereby to draw a facing surface of said cover into contact with said die surface;

placing a charge of said foamable composition into said interior volume of said cover defined between an inner surface of said cover and its peripheral edge when said cover is held in contact with said die surface by vacuum;

closing said cover portion of said foaming mold;

reacting said foamable composition to fill said interior volume of said cover with said foam material;

opening said foaming mold;

removing said cover, foam material and locating member from said foaming mold;

removing said locating member from said cover having said foam material therein thereby to form a covered article.

3,971,113

PRE-SHARPENED CUTTING TIP FOR SAW PLATE

Robert L. Budke, and Lowell C. Freeborn, both of Seattle, Wash., assignors to Systi-Matic Company, Seattle, Wash.

Filed July 2, 1975, Ser. No. 592,403
Int. Cl.² B27B 33/12
U.S. Cl. 29—95 R 6 Claims

1. A pre-sharpened, integrally formed cutting tip for insertion into the working edge of a saw blade, said tip comprising:

a tip body having an axis defining the central axis of said tip;

a cutter end containing a cutter edge formed at one end of said tip body, said cutter end being wider than a portion of said tip body and terminating in a planar surface laterally offset from said central axis; and

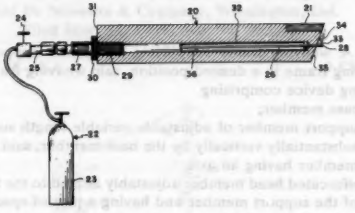
a stabilizing end formed at the other end of said tip body, said stabilizer end having an alignment surface laterally offset from the central axis by a distance substantially equal to the lateral offset of said cutter end so that the central axis of said tip may be aligned parallel to the plane of a saw plate placed along a line.

3,971,114

MACHINE TOOL HAVING INTERNALLY ROUTED CRYOGENIC FLUID FOR COOLING INTERFACE BETWEEN CUTTING EDGE OF TOOL AND WORKPIECE

George M. Dudley, 69 N. Boxwood St., Hampton, Va. 23369

Filed Jan. 27, 1972, Ser. No. 221,322
Int. Cl.² B26D 1/00; B23B 3/00
U.S. Cl. 29—106 2 Claims



1. In a tool for operating on a workpiece, wherein a coolant is applied to the interface between the tool cutting edge and workpiece, the improvement comprising:

a source of cryogenic coolant; tool means;

means internally defined by the tool means to carry the cryogenic coolant from the coolant source to the cutting edge of the tool means;

said means having opening means at the region of the cutting edge of the tool means to direct a stream of the cryogenic coolant at the interface between the tool cutting edge and the workpiece in such a direction that the chip cutting from the workpiece does not interfere with the stream;

and insulation means within the tool preventing the cryogenic coolant from boiling until it reaches the tool cutting edge to obtain maximum heat dissipation;

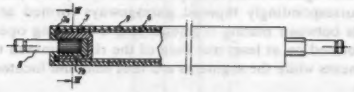
said means internally defined by the tool comprising a bore with an interfitting tubular structure to carry the coolant from the coolant source to the cutting edge of the tool, wherein said tubular structure terminates inside the tool near the tool cutting edge and further comprising conduct means directed at a precise angle to carry the coolant from the termination of the interfitting tubular structure to the tool cutting edge.

3,971,115

METHOD OF MAKING ROLLER

Siegfried Schneider, Durrnhaar; Kurt Thate, Munich: Erwin Geyken, Munich; Horst Kempe, Munich, and Stephan Macher, Munich, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Division of Ser. No. 375,850, July 2, 1973, Pat. No. 3,823,456.
This application Feb. 28, 1974, Ser. No. 446,923
Claims priority, application Germany, July 1, 1972, 2232424
Int. Cl.² B21H *1/14*
U.S. Cl. 29—148.4 D 9 Claims



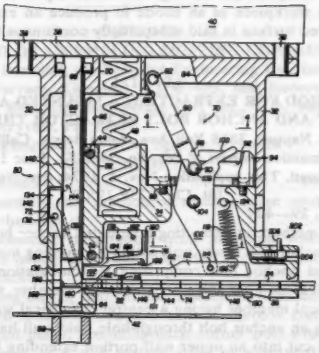
1. A method of producing chemically resistant rollers of the type having a tubular metallic core, comprising the steps of introducing portions of two inserts into the ends of a tubular core; confining the core and the inserts in the cavity of an injection mold; and injection-molding a chemically resistant coat about the exposed surfaces of the core and of the inserts, said coat bonding with said inserts, sealing the interior of the core and securing said inserts to the latter.

3,971,116

FASTENER INSTALLATION HEAD

Dale H. Goodsmith, and Harold A. Ladouceur, both of Livonia, Mich., assignors to Multifastener Corporation, Detroit, Mich.

Filed May 5, 1975, Ser. No. 574,773
Int. Cl.² B23P *19/04*
U.S. Cl. 29—208 D 4 Claims



1. In a nut installation head having a nut passage receiving a plurality of nuts in side to side relation, said nuts having a bore, a transverse plunger passage communicating with said nut passage, a plunger reciprocating in said plunger passage through the intersection of said passages to install a nut received in said plunger passage from said nut passage and a feed means feeding nuts to said plunger passage, the improvement comprising:

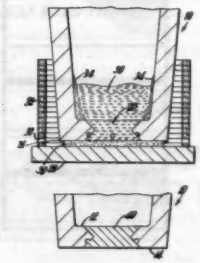
said feed means including a pawl reciprocating in said nut passage, said feed means reciprocating said pawl to engage a nut spaced from said plunger passage, said feed means then reciprocating said pawl toward said plunger passage to feed a nut into said plunger passage, and a restrictor means preventing nuts from withdrawing into said nut passage from adjacent said plunger passage, said restrictor means including an arm pivotally connected between its free ends to said housing adjacent said first passage, said arm being convex in configuration facing said head, one end having a laterally extending finger projecting and resiliently biased into said nut passage through an opening in said nut passage adjacent said plunger passage, the opposed end biased against said head said finger receivable within the nut bores in said nut passage preventing nuts from withdrawing into said nut passage and having a camming face facing the nuts entering said plunger passage, whereby nuts entering said plunger passage resiliently biases said finger out of its restricting position, permitting the feeding of nuts into said plunger passage.

3,971,117

METHOD OF REPAIRING INGOT MOLD BOTTOMS

Richard E. Osterhout; Walter A. McCray, both of Berea, Ohio, and Mark J. Rudowicz, Griffith, Ind., assignors to Hilti Aktiengesellschaft, Liechtenstein

Filed July 23, 1975, Ser. No. 598,221
Int. Cl.² B23P *7/00*; B22D *41/00*, *41/08*
U.S. Cl. 29—401 E 10 Claims



1. A method for repairing an eroded bottom of an ingot mold which comprises:

a. removing the eroded portion of the bottom;

b. forming a casting space in the mold bottom by cutting a hole through the bottom of the mold, the cross-sectional area of the hole varying such that the diameter of the hole at the inner and outer surfaces of the bottom of the mold are larger than the cross-sectional area of the hole at the interior portion of the mold bottom, the sides of the hole tapering outwardly from the interior portion of the mold bottom towards the inner and outer surfaces of the mold bottom;

c. cutting one or more notches in a portion of the outwardly tapering side of said hole which is between the point of the hole having the smallest cross-sectional area and the outer surface of the mold bottom;

d. placing the mold in an upright position on a smooth layer of a compactable refractory material;

e. providing a protective layer of a refractory material about the inner walls of the mold; said layer beginning at the

interior entrance of said hole and tapering upwardly and outwardly along the inner walls of the mold;

f. filling said casting space and a portion of the bottom interior volume of the mold with an alumino-thermic welding material in an amount effective to provide sufficient weld metal to fill said casting space;

g. igniting said alumino-thermic mixture;

whereby molten metal is formed from the aluminum thermic reaction and gravitates downwardly into and filling the casting space to form, on cooling, an insert firmly welded and locked into the casting space.

3,971,118

METHOD OF MAKING A COMPOSITE BAKING MOLD

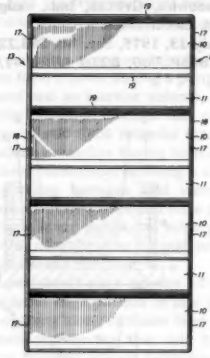
Magnus Allan Holmqvist, Amanuensvagen 2-114, S-104 05 Stockholm, Sweden

Filed Dec. 9, 1974, Ser. No. 531,003

Claims priority, application Sweden, Dec. 13, 1973, 7316830

Int. Cl.[2] B23P 17/00

U.S. Cl. 29—412 8 Claims



1. A method of making a composite baking mold having a plurality of individual mold spaces, said method comprising the steps of extruding light metal to form an elongated bar, extruding light metal to form an elongated section, cutting said bar perpendicular to its longitudinal axis to form a plurality of bars having the same longitudinal dimensions, said longitudinal dimension corresponding to the length of said composite baking mold, cutting said section perpendicular to its longitudinal axis to form a plurality of sections having the same longitudinal dimension, said longitudinal dimension corresponding to the width of said composite baking mold, affixing said sections to said bars at their engagement in a configuration such that said bars are spaced and are parallel to each other and said sections are spaced and are parallel to each other, said sections being disposed perpendicular to said bars and engaging said bars at each end thereof.

3,971,119

MANUFACTURE OF RINGS COMPRISING SEPARABLE SEGMENTS

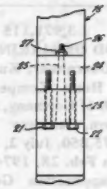
Gordon Richard Walker, Leamington Spa, England, assignor to Filton Limited, Leamington Spa, England

Filed Aug. 25, 1975, Ser. No. 607,263

Claims priority, application United Kingdom, Aug. 27, 1974, 37431/74

Int. Cl.[2] B23P 17/00

U.S. Cl. 29—416 8 Claims



1. A method of manufacturing a ring comprising separable segments, with the improvement that said segments are formed and assembled to constitute the ring and are held together against relative displacement by tapered pins located in correspondingly tapered passageways formed across the joints between mating segments and a finishing operation is performed on at least one face of the ring common to all the segments while the segments are thus held and located by said pins.

3,971,120

DIRECT-ON CERAMIC COATING OF CARBON-RICH IRON

Clifford G. Ruderer, Brecksville, Ohio, assignor to Ferro Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 535,441, Dec. 23, 1974, Pat. No. 3,923,611. This application Sept. 2, 1975, Ser. No. 608,961

Int. Cl.[2] B23P 3/02; C25D 5/36, 5/48; C23D 3/00

U.S. Cl. 29—460 25 Claims

1. In a process for the direct-on, ceramic coating of a carbon-rich, iron workpiece, the improvements prior to depositing the ceramic coat of:

a. pressure-bonding a substantially continuous layer of substantially pure iron onto said carbon-rich iron workpiece,

b. placing the workpiece and bonded iron layer in an electroconducting liquid medium, and

c. electrolytically removing some of the deposited iron using the workpiece as an anode to produce an exposed, fissured surface in said substantially continuous layer.

3,971,121

METHOD FOR EXTRACTING A MOUNTED ANCHOR BOLT AND ANCHOR BOLT EXTRACTOR THEREFOR

Jack C. Napper, 3815 Volt Ave., Long Beach, Calif. 90808

Continuation-in-part of Ser. No. 368,852, June 11, 1973, abandoned. This application Nov. 4, 1974, Ser. No. 520,774

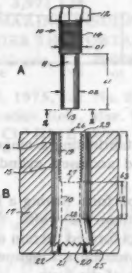
Int. Cl.[2] B23P 19/02

U.S. Cl. 29—427 6 Claims

1. A method for extracting a mounted anchor bolt secured to an anchor bolt cavity wall within a mounting member, said mounted anchor bolt comprising in combination a hollow cylindrical member and a conical wedge member, said hollow cylindrical member having a central cylindrical wall circumscribing an anchor bolt through-hole, said wall having screw threads cut into an upper wall portion extending from a top through-hole opening to a screw thread termination end intermediate said through-hole, said screw threads having an internal diameter substantially equal to or greater than the

through-hole diameter at said thread termination end, said thread termination end coinciding with an upper conical wedge seat wall portion said through-hole extending below said thread termination end and having seated therein said conical wedge, said conical wedge having a top small diameter portion seated within said seat and a conical wedge bottom large diameter portion resting on a bottom of said anchor bolt mounting cavity, said wedge bottom large diameter being smaller than said anchor bolt cavity diameter and larger than said through-hole, said anchor bolt thereby being secured within said cavity, said method for extracting said mounted anchor bolt comprising,

inserting into said mounted anchor bolt through-hole through said top through-hole opening a tool having threaded portion matable with said anchor bolt threads, said threaded portion being intermediate a top external tool connecting means and a cylindrical unthreaded



shank portion, said shank portion having a diameter smaller than said through hole and having a shank length greater than a distance between the anchor bolt screw thread termination and the conical wedge top small diameter portion seated within the anchor bolt conical wedge seat,

screwing said tool into the anchor bolt thereby forcing a disengagement between the conical wedge member and the anchor bolt hollow cylindrical member, and further forcing upwardly said anchor bolt hollow cylindricl member from the conical wedge member thereby releasing said anchor bolt hollow cylindrical member from the conical wedge member thereby releasing said anchor bolt hollow cylindrical member from fixed engagement with the anchor bolt cavity wall, and

lifting the anchor bolt hollow cylindrical member and the conical wedge member out of the cavity.

3,971,122

METHOD OF ASSEMBLING SHIPPING CONTAINER

William A. Bertolini, c/o Bertolini Engineering Co., Inc., Undercliff Terrace, Kinnelon, N.J. 07405, and Isadore Feinberg, c/o Bertolini Engineering Co., Inc., P.O. Box 338, Montgomeryville, Pa. 18936

Filed Oct. 31, 1974, Ser. No. 519,889
Int. Cl.[2] B23P *21/00*
U.S. Cl. 29—469 **9 Claims**

1. An assembly line method of making large containers comprising the steps of:

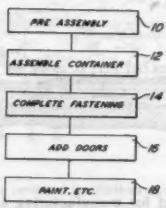
a. preassembling rectangular front and rear assemblies having a header and a sill connected at corner posts at a first location,

b. providing one of said sill and header on each assembly with two locater points in a surface thereon lying in a horizontal plane, providing each corner post with a locater point in a side surface lying in a vertical plane adjacent one end of the corner post, said side surfaces being parallel to each other and perpendicular to said horizontal plane,

c. producing an open rectangular roof assembly having two locater points on each end thereof at a second location,

d. producing a rectangular floor assembly with a locater point in a vertical surface at each corner thereof at a third location,

e. rigidly joining said assemblies at a fourth location to form a rectangular skeleton in a manner so that each locater



point on one assembly mates with another locater point on another assembly to thereby establish precise overall container dimensions,

f. then applying panels to the front, side and top of said skeleton, and

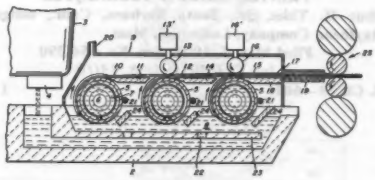
g. applying at least one door to said rear assembly after the rear assembly has been interconnected with other assemblies to form said skeleton.

3,971,123

PROCESS OF SOLIDIFYING MOLTEN METAL

Erik Allan Olsson, Zurich, Switzerland, assignor to Olsson International Inc., Pittsburgh, Pa.

Continuation of Ser. No. 337,931, March 5, 1973, abandoned.
This application Dec. 30, 1974, Ser. No. 537,561
Int. Cl.[2] B22D *11/06*
U.S. Cl. 29—527.7 **8 Claims**



1. A metallurgical process for the production of a semi-finished product for subsequent rolling or forging into a finished product, wherein

a. a melt of molten steel is simultaneously and continuously formed on moving chill surfaces into a plurality of layers of substantially uniformly fine grain structure throughout the thickness of each layer and stripping the layers from the chill surfaces as they are formed,

b. bringing such layers together in face-to-face contact when they are at the solidus temperature where the metal in the layers shows no apparent liquid at the surface but before it has developed sufficient plasticity for hot rolling,

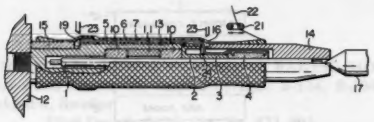
c. pressing the contacting layers together with a pressure only sufficient to reduce the thickness of the combined layers not more than 2% of the combined thickness, and

d. effecting the forming of the layers, the bringing them together and pressing them being effected in a common enclosure in which the hot metal is constantly protected by an inert atmosphere and removing the composite body so formed from said atmosphere only when it has cooled to at least a normal hot rolling temperature.

3,971,124
METHOD FOR MANUFACTURING CYLINDRICAL ARMATURE

Shigeru Sasaki, Katsuta, and Kiichi Nakamura, Hitachi, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Sept. 5, 1975, Ser. No. 610,783
Claims priority, application Japan, Sept. 13, 1974, 49-105048
Int. Cl.² H02K 15/10
U.S. Cl. 29—598 2 Claims

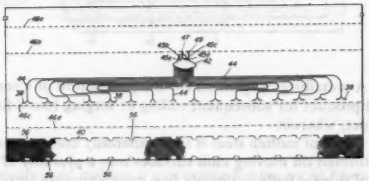


1. In a method for manufacturing a cylindrical armature comprising the step of forming an insulating layer by uniformly winding a glass filament impregnated with thermosetting resin at least onto the outer peripheral surface of a cylindrically arranged armature winding coupled with a rotor ring firmly fixed on the shaft of the armature, the improvement comprising the steps of mounting on the shaft of the armature a jig adapted to be separated into an effective part corresponding to said cylindrical armature winding and an ineffective part, arranging said cylindrical winding on the outer peripheral surfaces of said effective part of said jig and said rotor ring, winding uniformly said glass filament onto the outer peripheral surface of said cylindrical winding and said ineffective part, hardening said resin to form an insulating layer, and separating the part of the insulating layer on said ineffective part of said jig from the part of the insulating layer on said effective part and removing same, along with said jig, from the armature.

3,971,125
METHOD OF MAKING AN ANTENNA ARRAY USING PRINTED CIRCUIT TECHNIQUES

Wilbur H. Thies, Jr., Santa Barbara, Calif., assignor to Raytheon Company, Lexington, Mass.

Filed Mar. 3, 1975, Ser. No. 554,390
Int. Cl.² H01Q 1/38, 13/10
U.S. Cl. 29—601 1 Claim



1. The method of forming a conformal array antenna comprising the steps of:

a. forming a plurality of array modules, each one being formed by:

i. etching simultaneously on one surface of a flexible dielectric sheet, an array of radiating elements, a ground plane for such elements, a corporate feed network for such elements and a portion of a parallel plate lens coupled to the feed network;

ii. folding such dielectric sheet around a stiffener including: disposing the plurality of radiating elements in a first plane, and, positioning the ground plane behind the radiating elements in a plane orthogonal to the first plane; and

iii. bonding such folded dielectric sheet to such stiffener; and

b. arranging the plurality of array modules around a predetermined conformal surface.

3,971,126
METHOD OF FABRICATING MAGNETIC FIELD DRIVE COILS FOR FIELD ACCESSED CYLINDRICAL DOMAIN MEMORIES

Carl F. Buhrer, Framingham, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Division of Ser. No. 494,591, Aug. 5, 1974, Pat. No. 3,932,827.
This application Sept. 18, 1975, Ser. No. 614,821
Int. Cl.² H01F 41/06
U.S. Cl. 29—604 1 Claim

1. A method of fabricating a magnetic field drive coil arrangement for field accessed cylindrical domain memories including the steps of:

a. providing a coil form having a length which is substantially greater than the width, the form further having access openings formed therein at each lengthwise end of the form and having a longitudinal axis extending between the ends of the form,

b. positioning a first coil around the coil form such that the turns of the first coil in a central region of the coil form are parallel to the longitudinal axis and the turns of the first coil in a pair of peripheral regions of the coil form diverge away from the longitudinal axis, the step of positioning the first coil further including:

i. positioning a coil winding block into each access opening of the coil form, each block having a triangular shaped member with a number of slots formed in the tapered surfaces of the members, the number of slots corresponding to the number of turns of the first coil,

ii. winding a conductor around the triangular shaped members of both blocks, each turn being located in one of the slots,

iii. bending the turns of the first coil at the triangular shaped members toward the sides of the coil form, and then

iv. removing the coil winding blocks from the coil form, and

c. winding a second coil over the first coil such that the turns of the second coil and the first coil are perpendicular to each other in the central region.

3,971,127
METHOD OF FABRICATING A PRINTED WIRING BOARD ASSEMBLY

Winfield Joseph Giguere, Lincroft, and David Richard Padnes, Matawan, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 10, 1975, Ser. No. 611,911
Int. Cl.² H05K 3/30
U.S. Cl. 29—626 6 Claims

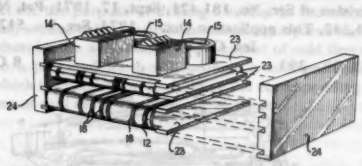
1. A method for fabricating a folded printed wiring board assembly comprising the following steps in the order named:

cutting at least one aperture into a rigid board,

bonding a flexible circuit tape to one side of the board so that the tape bridges the aperture,

perforating a plurality of holes through the board and the flexible tape,

inserting leads of electrical components through the holes, conductively bonding the compound leads to conductors on the flexible circuit tape,



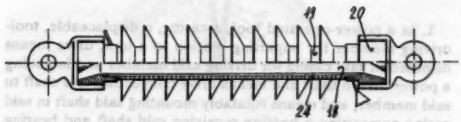
cutting two edges of the board through the aperture, and folding the assembly in the area of the aperture.

3,971,128

METHOD FOR MAKING INSULATORS AND INSULATORS THUS OBTAINED

Sergio Rebosio, Via Mantegna, 82, 20096 Pioltello (Milan), Italy

Filed Mar. 3, 1975, Ser. No. 555,176
Claims priority, application Italy, Mar. 9, 1974, 86230/74
Int. Cl.² H01B *19/00*
U.S. Cl. 29—631 **5 Claims**



1. A method for making insulators including a resin bar reinforced with fibers, provided with an external covering of electrically insulating material and terminal elements, comprising the steps of forming the bar from a fiber glass mass impregnated with a thermosetting resin; carrying out the complete polymerization or curing substantially for the major portion of the bar length, maintaining at least one end thereof cooled at a lower temperature than the complete polymerization or curing temperature for said resin; inserting the bar so formed in an insulating covering; applying a terminal element to said uncured end of the bar; widening the fiber glasses of the uncured end of the bar against a divergent or flared surface of the terminal, and carrying out a successive step of complete polymerization or curing for the resin at the end of said bar.

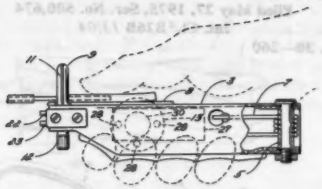
3,971,129

TOOL FOR STRIPPING INSULATION FROM MULTICONDUCTOR CABLES AND INDIVIDUAL INSULATED CONDUCTORS

Francis A. Adams, 88 Manchester Ave., North Haledon, N.J. 07508

Filed Feb. 24, 1975, Ser. No. 552,770
Int. Cl.³ H02G *1/12*
U.S. Cl. 30—90.1 **13 Claims**

1. A tool for stripping insulation from a multiconductor cable or individual conductor comprising a pair of rigid members, a pair of elongated blades each having a cutting edge, means for securing the blades to the rigid members with the cutting edges opposing one another and extending transversely from the same side of each of the members, the blades being arranged to receive the cable or conductor therebetween and to slice the insulation tangentially at opposite sides of the cable or conductor upon inserting the cable or conductor between the blades at one end thereof and moving the cable or conductor transversely between the blades toward the members and to slice the insulation circumferentially upon relative rotation of the tool and cable or conductor, the cutting edges being formed and arranged to engage the severed



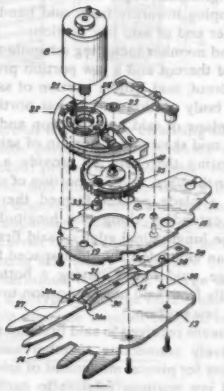
insulation and strip the severed insulation upon relative transverse movement of the blades and axial movement of the cable or conductor.

3,971,130

ELECTRIC GRASS SICKLE-SHEAR

William M. Querfurth, Niles, Ill.; Michael A. Schwartz, Willoughby Hills, Ohio, and Jon C. Wiltberger, Round Lake, Ill., assignors to Burgess Vibrocrafters, Inc., Grayslake, Ill.

Filed Sept. 30, 1974, Ser. No. 510,374
Int. Cl.² B26B *19/02*
U.S. Cl. 30—220 **16 Claims**

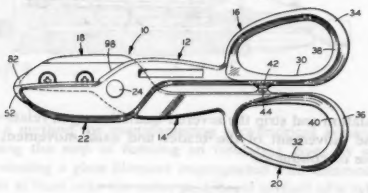


1. In a portable electric grass shear including a base plate having a plurality of spaced teeth, a cutting blade superjacent said base plate with a cutting tooth substantially in shearing engagement with said teeth, and motor and transmission means for driving said cutting blade, the improvement wherein said cutting blade is demountably pivoted for arcuate reciprocation at the rear end of said base plate and said transmission means includes a slide and a rotary crank having a crankpin drivingly engaging said slide, said slide being elongated and affixed to the blade and having a lengthwise groove into which the crankpin extends, said groove in the slide being open at least at its forward end whereby the slide and blade may be disengaged from the crankpin by withdrawing said blade rearwardly.

3,971,131
STRAIGHT PATTERN SNIPS

Alfred Z. Boyajian, Manhattan Beach, Calif., and Jules M. Don, Naugatuck, Conn., assignors to The Stanley Works, New Britain, Conn.

Filed May 27, 1975, Ser. No. 580,674
Int. Cl.[2] B26B 13/04
U.S. Cl. 30—260 8 Claims



1. A pair of straight pattern snips comprising:

a. a first member including a handle portion provided at one end thereof and a jaw portion provided at the other end thereof, said handle portion having a body portion and an ear portion skewed relative to the plane of said body portion to provide a comfortable hand hold for the user, said jaw portion having a blade pocket formed therein provided by a recess extending along one longitudinal edge and providing an elongated shoulder spaced from said longitudinal edge, said recess having a bottom surface sloping inwardly from said handle portion towards the outer end of said jaw portion;

b. a second member including a handle portion provided at one end thereof and a jaw portion provided at the other end thereof, said handle portion of said second member having body portion and an ear portion skewed relative to the plane of said body portion and in the same direction as said skewed ear portion of said first member and cooperating therewith to provide a comfortable hand hold for the user, said jaw portion of said second member having a blade pocket formed therein provided by a recess extending along one longitudinal edge adjacent said one longitudinal edge of said first member and providing an elongated shoulder spaced from said longitudinal edge, said recess having a bottom surface sloping upwardly from said handle portion towards the outer end of said jaw portion;

c. pivot means received in said first and second members for operatively connecting together said first and second members for pivotal movement of said longitudinal edges of said jaw portions relative to each other between an open and a closed position;

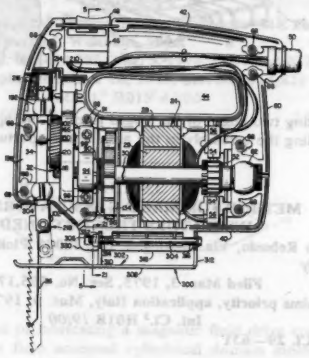
d. blade members supported in said blade pockets of each of said first and second members upon said inclined bottom surface thereof with a cutting edge extending longitudinally thereof beyond the said longitudinal edge of said jaw portion so as to be inclined upwardly from said handle portion and towards the other blade member whereby the blade set of said blade member is obtained from the inclined bottom surface of said recess and said cutting edge of one blade member abuts the surface of the blade member of the other member, each of said blade members having an elongated non-cutting edge spaced from said cutting edge and abutting said shoulder; and

e. fastening means for securing each of said blade members in said blade pocket of the cooperating one of said first and second members against movement therewithin.

3,971,132
SABER SAW

David R. Griffies, Joppa, Md.; Russell O. Robison, Plymouth, Ohio, and Robert W. Taylor, Jackson, Tenn., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Division of Ser. No. 181,471, Sept. 17, 1971, Pat. No. 3,863,342. This application Oct. 7, 1974, Ser. No. 512,789
Int. Cl.[2] B27B 19/09
U.S. Cl. 30—393 8 Claims

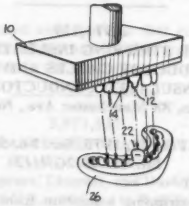


1. In a power-operated tool, a casing, a displaceable, tool-driving member for imparting motion to a tool, drive means disposed in said casing for driving said member and including a power driven shaft and means drive connecting said shaft to said member, and means rotatably mounting said shaft in said casing comprising a bearing receiving said shaft and bearing holder means supporting said bearing in said casing, said bearing holder means comprising first and second parts having seating surfaces that define segments of an annular seat for said bearing, said first part being fixed in said casing, fastening means securing said second part to said first part, and coacting protuberance and groove means on said first and second parts for locating said second part transversely of said first part.

3,971,133
DENTAL RESTORATION

David R. Mushabac, 18 Graham Ave., Brooklyn, N.Y. 11206

Filed Oct. 29, 1974, Ser. No. 518,266
Int. Cl.[2] A61C 13/00
U.S. Cl. 32—2 10 Claims



1. A set of paired preform teeth comprising:

a first subset of preform teeth, each having a deformable body portion, a non-deformable front surface facing spaced from the proximal sides and gingival surface, and a non-deformable biting surface facing,

a second subset of non-deformable preform teeth, each member of said second subset corresponding to one of said first subset, said correspondence including congruence between the front surface facing and biting surface

facing of corresponding preforms from said first and second subsets,

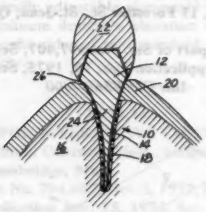
whereby, an impression model formed from a configuration including a member of said first subset will properly hold and align the corresponding member of said second subset for the purpose of drilling a socket in the member of said second subset for placement on a prepared tooth and whereby the adjustment of a member of said first subset on a prepared tooth will provide a configuration from which the impression for holding the corresponding member of said second subset can be made.

3,971,134

CARBON DENTAL IMPLANT WITH ARTIFICIAL PERIODONTAL LIGAMENT

Jack C. Bokros, San Diego, Calif., assignor to General Atomic Company, San Diego, Calif.

Filed Jan. 31, 1975, Ser. No. 545,996
Int. Cl.² A61C *13/00*
U.S. Cl. 32—10 A **5 Claims**



1. A prosthesis for dental replacement in a living body comprising a carbon root having an abutment adapted for affixation of a dental crown thereto, and having a base portion shaped for insertion into a mandible tooth socket, said carbon root having a modulus of elasticity of from about 3×10^6 psi. to about 6×10^6 psi., a compressive strength along its axis sufficient to support a compressive load of at least 200 pounds, and a flexural strength along its axis to support a bending moment of at least 20 inch-pounds, said base portion of said carbon root having a biologically inert, porous organopolymeric coating thereon with a thickness of from about 0.1 to about 1.0 mm and a bulk modulus of elasticity of from about 1×10^6 psi. to about 5×10^6 psi., said organopolymeric coating having a pore structure extending at least 0.1 mm. into said organopolymeric coating and which permits attachment of tissue thereto through tissue ingrowth while retaining the resiliency of the polymer layer, the pore structure of said organopolymeric coating having a volume percentage of accessible porosity of from about 10 to about 50 percent, and said organopolymeric coating being limited to said base portion of said carbon root which is intended to interface with bone upon implantation.

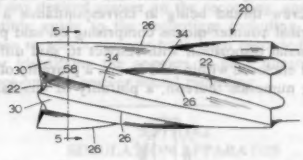
3,971,135

DENTAL BUR

Robert F. Leu, Delta, Ohio, assignor to Dentsply Research & Development Corporation, Milford, Del.

Continuation of Ser. No. 505,178, Sept. 11, 1974, abandoned.
This application Sept. 4, 1975, Ser. No. 610,206
Int. Cl.² A61C *3/02*
U.S. Cl. 32—48 **16 Claims**

1. A helical dental bur comprising a shank and a head fixed to one end thereof, said head being provided with a plurality of similar teeth extending longitudinally therealong and having a sturdy sharp cutting edge outermost thereon, each of said teeth having a flat cutting face extending from the cutting edge radially toward the axis of the head, a relief surface which is convex in cross-section extending from said cutting edge partially toward the cutting face of the next succeeding tooth, and a chip-receiving gash having a concave surface in cross-section which extends between said relief surface and said flat cutting face, thereby to provide teeth on a dental bur



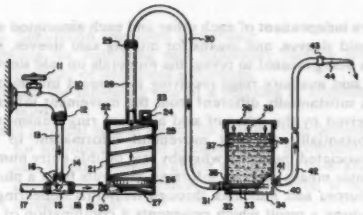
which have a positive cutting rake afforded by said flat cutting face and a cutting edge rendered strong by said convex relief surface, in combination with a relatively deep chip gash adjacent said flat cutting face without sacrificing strength for the cutting edge of each tooth.

3,971,136

HYGIENIC SPRAY APPARATUS

Erik H. Madsen, 3230 S. 9th East, Salt Lake City, Utah 84106

Filed May 16, 1974, Ser. No. 470,365
Int. Cl.² A61C *3/10*
U.S. Cl. 32—58 **6 Claims**



1. Hygienic apparatus for spraying cleansing slurries which include minute plastic particles, said apparatus including, in combination: a closed, pressurized, container having a premixed slurry therein, said slurry comprising a liquid carrier and plastic particles disposed therein, said container including an inlet, an outlet, and means for maintaining said particles in suspension in said carrier during slurry discharge through said outlet, for pressurizing said slurry within said container and for forcing a predetermined volumetric charge of said slurry through the outlet, a jettype discharge nozzle above said container, and a flexible elongate conduit coupled between said outlet and said nozzle.

3,971,137

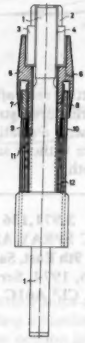
SYSTEM FOR MILLESIMAL MEASURE

Pablo Martinez Fernandez, Madrid, Spain, assignor to Francisco Martin Martin, Burgos, Spain

Filed Dec. 17, 1973, Ser. No. 425,296
Claims priority, application Spain, Dec. 15, 1972, 409638
Int. Cl.² G01B *3/18*
U.S. Cl. 33—164 R **3 Claims**

1. In a millesimal measure device having screw threads of different pitches which each produce a micrometric advance and in combination produce a differential advance of as small a pitch as desired by subtraction or addition of the pitches used, comprising: a differential cylinder; a first screw thread in the inner surface of said differential cylinder, said first screw thread having a first pitch; a principal screw having a principal screw thread which has a suitable pitch for micrometric measurement, said principal screw thread and said first

screw thread being in correspondence; a second screw thread on the outer surface of said differential cylinder, said second screw thread having a second pitch different than said first pitch; an outer frame having windows defined therein a third screw thread on said outer frame whose threads are of suitable pitch for differential measurement said second screw thread and third screw thread being in correspondance a double entry numerical counter means comprising on said principal screw in coaxial disposition with respect to said differential cylinder and enclosed within said frame, a plurality of sleeves each having numerals thereon, a plurality of auxiliary rings



which are independent of each other and each associated with one of said sleeves, and means for moving said sleeves, said windows being located to reveal the numerals on said sleeves, each of said auxiliary rings receiving movement information which is substantially different from the movement information received by the other of said auxiliary ring transmitting said substantially different movement information to the sleeve associated therewith whereby said double entry numerical counter means receives information inputs from a plurality of sources and indicates through numerals appearing in said windows a result which represents a combination of the inputs received from said plurality of sources.

3,971,138

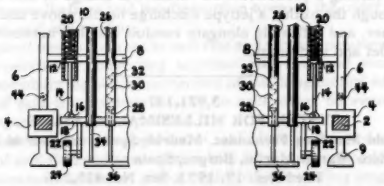
ADJUSTABLE MOLDING SYSTEM

Paul J. Worley, Box 23, Alto, Ga. 30510

Filed Aug. 7, 1975, Ser. No. 602,901

Int. Cl.² G01B *5/00, 5/20;* B29C *23/00*

U.S. Cl. 33—174 L **6 Claims**



1. An adjustable molding system comprising a tracer mechanism and a copy mechanism, the tracer mechanism comprising a first frame defining a plane and having transverse and longitudinal directions, a first carrier, means mounting the first carrier for longitudinal sliding movement on the frame, a plurality of tracer splines, means slidably mounting said tracer splines on said first carrier for sliding movement transversely to the plane of the frame, said tracer splines being arranged side-by-side transversely of the frame, a tracer-shaping member of flexible material secured on the ends of the splines, the copy mechanism comprising a second frame defining a plane and having transverse and longitudinal directions, a second carrier, means mounting the second carrier for movement longitudinally of said second frame, a plurality of copy splines corresponding in number to said plurality of tracer splines on the copy side, means mounting said copy splines on said second carrier for sliding movement transversely to the plane of the second frame, said copy splines being arranged side-by-side transversely of the second frame, a copy-shaping member of flexible material secured on the ends of the copy splines remote from the carrier, first transmitting means responsive to longitudinal sliding movement of the first carrier to produce movement of the second carrier longitudinally of the second frame along the second frame in the same direction, and second transmitting means responsive to the movement of each of the tracer splines to move a corresponding one of the copy splines by a proportionally equal amount in the same direction with respect to the second frame.

3,971,139

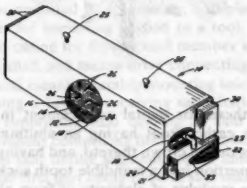
PROCESS AND APPARATUS FOR DECREASING MOISTURE CONTENT IN WOOD

Marcel A. Rochon, 11 Forestier St., St.-Jean, Quebec, Canada (J3B 4P4)

Continuation-in-part of Ser. No. 397,407, Sept. 14, 1973, abandoned. This application Feb. 10, 1975, Ser. No. 548,391

Int. Cl.² F26B *7/00*

U.S. Cl. 34—13.8 **13 Claims**



1. A process for decreasing the moisture content in wood which comprises the following consecutive steps:

a. placing the wood in an enclosure and introducing vapor made essentially of sap in said enclosure until the center of the wood has substantially reached the temperature of the vapor,

b. gradually raising the temperature of the vapor atmosphere to a temperature substantially above the boiling temperature and during a time sufficient to bake the resinous substances inside the wood and to reduce the moisture content to a predetermined percentage, and

c. subsequently reducing gradually the temperature of the vapor down to the boiling temperature by the introduction of a vapor of sap,

wherein the inside of the enclosure is maintained during the steps of the process at a pressure slightly above the atmospheric pressure.

3,971,140

KEYBOARD INTERCEPTOR ("INTERMEGRAF")

Arcadio Martinez, 140 SW. 12 Ave. (Apt. 11), Miami, Fla. 33130

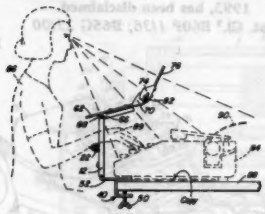
Filed Feb. 28, 1975, Ser. No. 505,754

Int. Cl.² G09B *13/00*

U.S. Cl. 35—5 **5 Claims**

1. An upright standard having front and rear sides and mounting means on its lower end for releasable mounting from a support upon which a typewriter may be placed, a generally horizontal panel structure pivotally mounted from the upper end portion of said standard and projecting to the rear and outwardly beyond the lateral sides of the standard for overlying the keyboard of a typewriter disposed on said sup-

port immediately to the rear of and generally laterally centered relative to said standard for blocking the area of the keyboard from the area of forward and downward vision of a person seated in front of the support for typing on the typewriter, a horizontal transverse bar supported from the vertical mid-portion of said standard and vertically adjustable along



the latter with the opposite end portions of said bar projecting outwardly from the corresponding sides of said standard, said bar being vertically adjustable along said standard for establishing the minimum desirable elevation of the wrists, positioned on opposite sides of said standard, of a person typing on said typewriter.

3,971,141

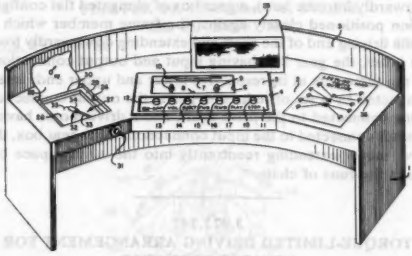
METHOD FOR INTERACTIVE COMMUNICATIONS

Stewart W. Wilson, Concord, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 294,487, Oct. 2, 1972, Pat. No. 3,942,268. This application Apr. 15, 1974, Ser. No. 460,730

Int. Cl.[2] G09B *5/06*

U.S. Cl. 35—8 A **6 Claims**



1. The method of preparing an interactive lecture, comprising the steps of audibly reproducibly recording a lecture on a record medium, reproducing the lecture from said record medium for a plurality of listeners, soliciting questions from the listeners relating to points in the lecture, assembling from the questions so solicited a list of questions to be answered, recording audible answers to the questions on said list in audibly reproducible form on a second record medium in a sequence corresponding to the order in which the questions would most probably be asked in the course of the lecture, marking the locations of said recorded answers on said second record medium to facilitate the location and audible reproduction of any desired answer on the recording, and preparing a visually interpretable guide to the lecture including a list of the questions to which answers have been recorded and instructions for identifying the answers to each question from the markings on said second recording medium.

5. The method of preparing a set of sound recordings and a cooperative guide for use by an individual of a selected class to approximate a learning conversation between that individual and an expert, comprising the steps of making a reproducible sound recording of a discourse on a selected topic by the expert, soliciting questions related to the recording from listeners representative of said class, assembling from the solicited questions a list of questions to be answered, making a reproducible sound recording of answers to said list of questions by said expert, marking the locations of said recorded answers on said answer sound recording to facilitate the location of any desired answer on the recording, and preparing a perceptible guide to the recordings including a list of the questions to which answers have been recorded and instruction for identifying the answers to each question from the markings on said answer sound recording.

3,971,142

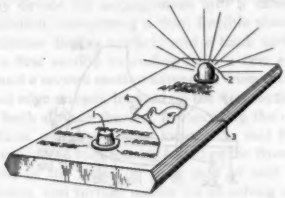
SIMULATION APPARATUS

James Fisher Hollander, 40 Middlesex St., Matawan, N.J. 07747

Filed May 23, 1975, Ser. No. 580,308

Int. Cl.[2] G09B *19/00*

U.S. Cl. 35—22 R **34 Claims**



1. Simulation apparatus comprising

means for indicating and adjustably varying levels of a plurality of decisional influences;

means for indicating one of a plurality of alternative decisions;

and physical system means for causing said decision indicator to indicate a first decision when a combined total of said variable levels is above a threshold level and to indicate a different decision when said total is below said threshold level.

3,971,143

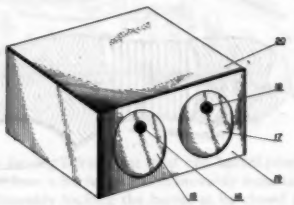
DEVICE FOR TESTING THE ABILITY OF A PERSON TO RECOGNIZE SYNCHRONOUS SPEEDS

Waclaw Kazimierz Slomski, 426 Wilkinson St., Syracuse, N.Y. 13204

Filed Mar. 19, 1975, Ser. No. 557,661

Int. Cl.[2] G09B *19/00*

U.S. Cl. 35—22 R **4 Claims**



1. Apparatus for testing the capacity of perceiving motion which comprises a pair of rotatable discs with identical indicia applied thereto, said discs being located where they can be viewed simultaneously by a person being tested, separate electric motors each driving a separate said disc, electric circuit means supplying electric current to each said motor, one of said discs being driven by its corresponding electric motor at a predetermined constant rotational speed, auto-

matic control means continually changing the rotational speed of the other of said discs in a predetermined manner whereby the rotational speed of said other disc varies within a range from lower than that of the one said disc to higher than that of the one said disc, rotational speed indication means indicating the rotational speed of said other disc, and selector means for the person being tested to signal when in his judgment the rotational speeds of said pair of discs are the same.

3,971,144

COMBINATION SKI BOOT AND WALKING SOLE AND CONNECTION MEANS FOR SUCH COMBINATION

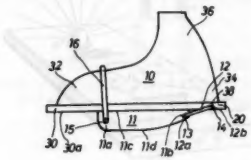
Ruth Brügger-Stuker, Spiez, Switzerland, assignor to Panta AG, Zurich, Switzerland

Filed Nov. 5, 1975, Ser. No. 628,913

Claims priority, application Switzerland, Nov. 8, 1974, 15010/74

Int. Cl.² A43B 00/00

U.S. Cl. 36—100 5 Claims



1. The combination with a ski boot having tread surface means and a walking sole of a connection element for securing the walking sole to the ski boot, said connection element including means for mounting the walking sole at the ski boot such that the walking sole can be pivoted about at least one axis of rotation at the ski boot away from the tread surface means of the ski boot into a position adjacent the upper of the ski boot, said position enabling the ski boot to be inserted into a ski binding without the walking sole, during skiing with the ski boot, having to be carried at any location other than at the ski boot itself.

3,971,145

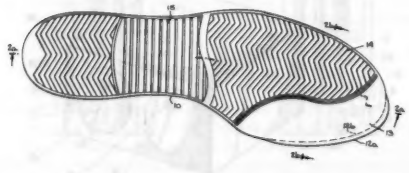
TENNIS SHOE AND SOLE THEREFOR

Harry R. Stegerwald, Cheshire, Conn., assignor to Uniroyal Inc., New York, N.Y.

Filed May 22, 1975, Ser. No. 580,120

Int. Cl.² A43B 13/04

U.S. Cl. 36—32 R 7 Claims



1. A sole for a tennis shoe comprising:

an elastomeric body having an elongated bottom portion and having an upwardly extending side portion having a given horizontal thickness at the junction thereof with said bottom portion along the side boundary of said body except in a toe region and an inside ball-of-the-foot region, said upwardly extending side portion in said toe region and inside ball-of-the-foot region being horizontally thicker at the junction thereof with said bottom portion than said given thickness.

3,971,146

REENTRANT DRIVING ARRANGEMENT FOR SCRAPER ELEVATOR

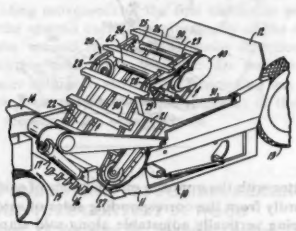
John H. Hyler, Peoria, Ill., assignor to Westinghouse Air Brake Company, Pittsburgh, Pa.

Filed Mar. 14, 1975, Ser. No. 558,226

The portion of the term of this patent subsequent to July 27, 1993, has been disclaimed.

Int. Cl.² B60P 1/36; B65G 23/00

U.S. Cl. 37—8 13 Claims



1. For use with a tractive vehicle, an earth moving machine including a receptacle in the form of a wheeled bowl having vertical side sheets, a floor and an open front with a scraper blade spanning the open front, a draft frame for securing the bowl to the vehicle, an elevator having a pair of interconnected frame members inclined upwardly and rearwardly from the region of the blade, a pair of endless conveyor chains having spaced upward and downward runs, the frame member having sprockets at the upper end and rollers at the lower end for supporting the chains, the sprockets being mounted on a drive shaft extending between the frame members and whch has a driving end, the chains having a series of transverse flights for conveying soil loosened by the blade upwardly and rearwardly into the bowl, a gear box of elongated flat configuration positioned closely against the frame member which is at the driving end of the shaft and extending downwardly from the latter, the gear box having input and output connections on the same side at its respective lower and upper ends interconnected by a set of reduction gears, the output connection being connected to the drive shaft, and a drive motor having its shaft connected to the input connection of the gear box, the drive motor extending reentrantly into the empty space between the runs of chain.

3,971,147

TORQUE-LIMITED DRIVING ARRANGEMENT FOR SCRAPER ELEVATOR

John H. Hyler, Peoria, Ill., assignor to Westinghouse Air Brake Company, Pittsburgh, Pa.

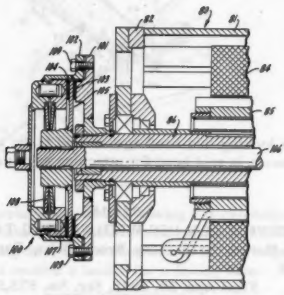
Filed Mar. 31, 1975, Ser. No. 563,486

Int. Cl.² B60P 1/36

U.S. Cl. 37—8 15 Claims

1. In an earth moving machine of the type having a wheeled bowl assembly with an open front end defining a soil receptacle as well as a scraper blade mounted on said assembly adjacent the open end of the receptacle, the combination comprising an elevator having a frame inclined upwardly and rearwadly from the region of the blade and having lateral surfaces, the elevator having a pair of conveyor chains and a drive shaft at the upper end thereof mounting sprockets for driving the chains and having supportive rollers at the lower end, the chains having a series of flights for conveying soil from the blade upwardly and rearwardly for deposition in the receptacle, a step-down gear box at the upper end of the frame including a set of reduction gears and having an input connection and an output connection, the gear box being of thin, flat construction in the axial direction and presenting an inside surface lying flatly in a laterally accessible position adjacent one of the lateral surfaces of the elevator frame, the input and

output connections being located in laterally spaced positions projecting from the inside surface of the gear box, the output connection being alined with and connected to the drive shaft, a driving motor coupled to the input connection, the motor having a flywheel mass, and a friction slip clutch interposed between the flywheel mass and the input connection of the gear box, the slipping torque of the friction clutch being set to



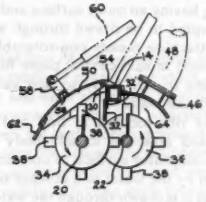
provide a drive connection which resists slippage during normal loading of the flights including peak loads while permitting slippage upon blockage of the drive shaft when a flight engages a more stubborn obstruction causing the set level of torque to be exceeded thereby to dissipate the kinetic energy stored in the flywheel mass and to prevent the development of torque in the gear box at a destructive level.

3,971,148

DREDGE CUTTER HEAD

Troy M. Deal, 277 Trismen Terrace, Winter Park, Fla. 32789

Filed Feb. 10, 1975, Ser. No. 548,576
Int. Cl.[2] E02F *3/88*
U.S. Cl. 37—66 **5 Claims**



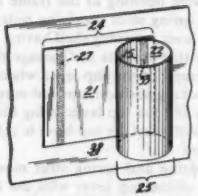
1. A dredge cutter head comprising a horizontally disposed auger structure, comprising two augers supported for rotation about parallel axes, means for rotating said augers in timed relation in the same direction, a slotted cutting bar disposed above and between said axes, radial projections axially spaced along said augers and disposed in common planes normal to said axes, said projections in each common plane traversing a common slot of said bar from different directions, the projections on one auger having an upward arcuate movement through the common slot and the projections on the other auger having a downward arcuate movement through the same slot in timed relation, a hood comprising front and rear sections substantially coaxial with said auger structure and located on opposite sides of said bar to provide a passageway between said structure and the under surfaces of said hood sections, an opening defined in said rear hood section, and a suction inlet communicating with said passage through said opening whereby dispersion of dredged material into the surrounding water is mitigated.

3,971,149

DISPLAY DEVICE

Oliver Morley Tanney, Englewood, N.J., assignor to Goodren Products Corporation, N.J.

Filed June 18, 1975, Ser. No. 587,896
Int. Cl.[2] G09F *19/00*
U.S. Cl. 40—126 A **8 Claims**



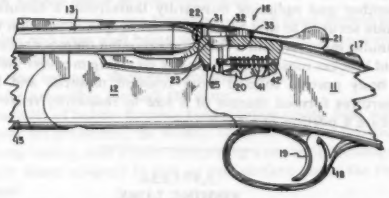
1. A display device for arrangement into a three-dimensional configuration, comprising a thin, flexible sheet having a front information display surface, and a back surface, the sheet having a first section extending from a first edge to a dividing line, and a second section extending from the dividing line to a second edge, means, located on the first section of the sheet on said back surface thereof, for securing the device to a support surface, adhesive means located on said front surface proximate said line for securing together the front surface of said sections of the sheet on each side of said line and proximate thereto, and further means for attaching a portion of the second section proximate the second edge to said back surface near said dividing line, whereby upon arrangement of said device in its three-dimensional configuraion, said adhesive means adjacent said dividing line secures together the front surface of said sections adjacent a crease along said dividing line and said second section projects forward of the plane of the first section in a three-dimensional configuration, with said edge portion attached to said back surface near said line.

3,971,150

TOP LEVER RETAINING MEANS FOR BREAK-OPEN FIREARMS

William B. Ruger, Southport, and Lawrence L. Larson, Bethany, both of Conn., assignors to Sturm, Ruger & Co. Inc., Southport, Conn.

Filed Apr. 22, 1975, Ser. No. 570,445
Int. Cl.[2] F41C *11/08*
U.S. Cl. 42—44 **8 Claims**



1. In a firearm having a frame, at least one barrel pivotally mounted on the frame; a barrel lock bolt movably mounted on the frame for releasably locking the barrel at its closed position; a top lever removably mounted on the frame, said top lever being rotatable to move the lock bolt from its barrel locking position to its barrel unlocking position and return; and top lever retaining means for retaining the top lever on the frame; the improvement in top lever retaining means which comprises;

a top lever having a bearing surface adapted to rest on a corresponding support surface of the frame, and a radially offset vertically elongated lock bolt operating crank disposed a predetermined distance below the bearing

surface of the top lever, said operating crank having a spring strut receiving notch and a lock bolt operating portion;

a frame having a top lever receiving opening in which the top lever is rotatably received, a lever retaining shelf located at the top lever receiving opening of the frame, and a spring strut retaining shelf located below the top lever receiving opening of the frame adjacent the upper end of the spring strut receiving notch of the operating crank, said lever retaining shelf having an operating crank passageway that permits the passage therethrough of the operating crank of the top lever when the top lever is at its barrel locking position, upward movement of the operating crank and the top lever being blocked by said lever retaining shelf when the top lever is at its barrel unlocking position; and

a top lever spring and spring strut mounted in the frame rearwardly of the top lever with the forward end of the spring strut received in the spring strut receiving notch of the operating crank of the top lever, upward movement of the forward end of the spring strut and the top lever being blocked by the strut retaining shelf when the top lever is at its barrel locking position.

3,971,151

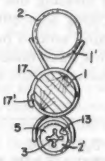
FISHING HOOK HOLDING MEANS

Philip M. Banner, 28 Oxford Road, Massapequa, N.Y. 11758

Continuation-in-part of Ser. No. 440,991, Feb. 11, 1974, abandoned. This application Jan. 16, 1975, Ser. No. 541,656

Int. Cl.² A01K *87/04*, *97/06*

U.S. Cl. 43—24 **6 Claims**



1. A combination fishing pole line guide and fishhook holder comprising an annular member having a central opening of a size to securely grip a fishing rod section, bracket means attached to the outer peripheral surface of said annular member and radiating outwardly therefrom, a circular line guide secured to said bracket means in spaced relation to said annular member, and a fishhook retaining member secured to said bracket means, said fishhook retaining member including a body portion formed from resilient material and having apertures formed therein of a size to resiliently receive and secure a portion of a fishhook.

3,971,152

FISHING LURE

Frank Husson, Jr., La Jolla, Calif., assignor to Applied Oceanographic Technology Corporation, Southampton, N.Y.

Filed May 14, 1975, Ser. No. 577,551

Int. Cl.² A01K *85/00*

U.S. Cl. 43—42.06 **8 Claims**

1. A fishing lure comprising:

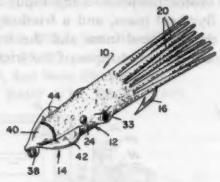
a flexible, elastomeric body comprising a hollow cylinder having axial forward and aft ends;

inwardly extending shoulders within said cylinder defining said aft end and including a narrow opening therebetween;

at least one opening in the wall of said cylinder;

an axial opening in the forward end of said cylinder;

a solid head including an integral hook extending aft from the base of said head, said body being adapted to slide over said hook and against said base;



means locking said head against said body; and

eye means in said head for attaching said lure to a line.

3,971,153

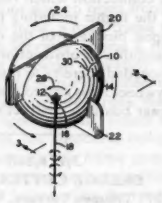
DEVICE FOR USE WITH FISHING TACKLE

John F. Harms, 6418 Stony Brook Drive, Fort Wayne, Ind. 46815

Filed Apr. 30, 1975, Ser. No. 573,583

Int. Cl.² A01K *91/00*

U.S. Cl. 43—43.13 **5 Claims**



1. A device for restoring the lay of a line, such as a fishing line, comprising:

a spherical body having an outer surface and a central plane and being adapted to be drawn through water;

a pair of line attaching means non-rotatably fixed to said body and located in said central plane for non-rotatably attaching a line to said body so that said body can be drawn through the water;

first and second ribs located in first and second planes respectively and attached to said body to extend outwardly from said outer surface to contact the water and be acted upon by the water in a manner to cause rotation of said body as it is drawn through the water, said first and second planes being essentially perpendicular to each other and to said central plane;

said attaching means being fixed to said body for rotation therewith so that rotation of said body causes rotation of the line in one direction when it is attached to a first one of said pair of attaching means, and rotation of the line in an opposite direction when it is attached to the other one of said pair of attaching means, said attaching means being essentially symmetrically located on said body with respect to said ribs, so that line rotation in both directions is essentially uniform.

3,971,154

TROLLING PLANER

Henry A. Craig, 4130 S. Elm, Rapid City, S. Dak. 57701

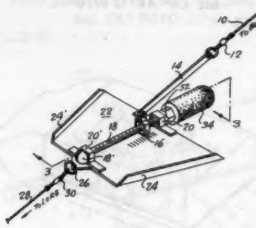
Filed Oct. 3, 1975, Ser. No. 619,490

Int. Cl.² A01K *95/00*

U.S. Cl. 43—43.13 **5 Claims**

1. A trolling planer comprising a planer plate having a leading and trailing edge, a rotatable threaded element ex-

tending rearwardly from the leading edge of said planer along its center line, non rotatable nut means mounted on said rotatable threaded element to be moved therealong by rotation of said threaded element, a towing bar pivotally secured to said non rotatable nut means, means on said towing bar to receive a fishing line, and means at the trailing edge of said planer plate to receive a leader for a fishing lure.

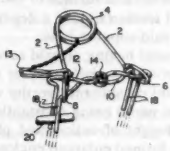


3,971,155

ACTUATOR FOR ANIMAL TRAP

Frank R. Conibear, 2170 Evergreen Place, Victoria, British Columbia, Canada

Filed Oct. 21, 1974, Ser. No. 516,580
Int. Cl.² A01M 23/26
U.S. Cl. 43—90 7 Claims



1. In an animal trap of the type having two similar first and second frames made of round wire stock, each having sides serving as jaws and ends extending therebetween, and which are pivotally connected through adjacent ends for relative rotation between set and closed positions about a common axis, trigger means for releasably maintaining the trap in set position and an actuator made of round wire stock, capable of rapidly and forcefully effecting such rotation upon release of the trigger, having two arms spring-biased at one end so that the other end, if unobstructed, would move to a distance substantially greater than the length of said frame ends, each arm terminating in a ring respectively adapted to encircle adjacent ends of both frames on opposite sides of said axis, an improved actuator wherein each actuator ring is of a regular oblong shape symmetrical about the major axis and the minor axis, the major axis being in the general direction of the respective actuator arm and having a length of a ratio of about 5:3 to the length of the minor axis.

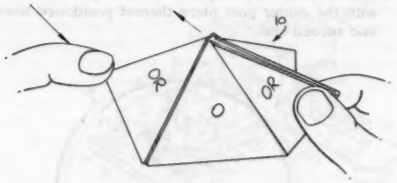
3,971,156

INTERCHANGEABLE-FACE DEVICES AND METHOD OF MAKING SAME

Stewart Lamlee, 55 W. 86th St., New York, N.Y. 10024

Filed Oct. 8, 1975, Ser. No. 620,808
Int. Cl.² A63H 33/14
U.S. Cl. 46—1 L 8 Claims

1. An improved interchangeable-face device comprising a first row of alternatively disposed equilateral triangles equally spaced apart, with link members bridging the interspaces, to form a single unit thereof, a second row of identical triangles similarly spaced and linked to form a single unit, and an intermediate flat pliant binder element of identical shape, means to bond one row of triangles to each surface of the binder element so as to bring the triangles and interspaces of each row in registry with the other, with the exposed portions of the



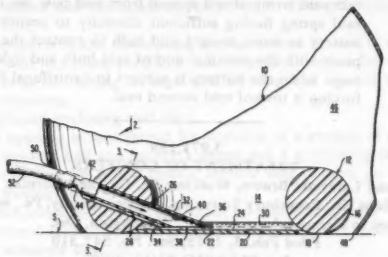
binder element adapted to act as hinges between adjoining triangles, the triangles being schematically overlaid, with end triangles in registry, and means to bond the end triangles together to form of the device a polygon, the latter adapted to be progressively flexed at one side and extruded at the other to progressively expose different groups of triangle faces.

3,971,157

BUBBLE MACHINE WITH PROTECTIVE TRANSPARENT DOME

Robert E. Gillis, P.O. Box 67, Aptos, Calif. 95003

Filed Nov. 3, 1975, Ser. No. 628,282
Int. Cl.² A63H 33/28
U.S. Cl. 46—7 5 Claims



1. A bubble effect device comprising:
a weighted annular ring having a base wall fixed thereto said ring and base wall being adapted to rest on a supporting surface;
the ring having a slant bore formed therein;
a tube extending through the bore;
a quantity of bubble forming fluid solution on the base wall;
means for protecting the bubble effect to make it relatively long lasting, said means comprising a protective transparent dome adapted to rest on said surface about the ring; and
hose means connected to the tube and extending outwardly of the dome to introduce air therethrough into the solution.

3,971,158

ILLUMINATED TWIRLING TOY

Cameron G. Hanson, Osceola, Wis. 54020

Filed Sept. 4, 1974, Ser. No. 503,140
Int. Cl.² A63H 1/24
U.S. Cl. 46—228 9 Claims

9. A toy which in operation assumes a circular motion providing a variation in velocity at points on its body, said toy comprising

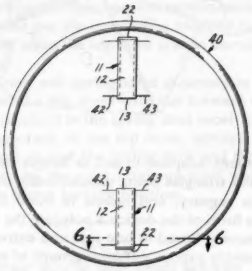
a handle shaped to be held in one hand and having an opening therein defining a large entrance end and terminating with a wall having a small aperture,

a cord extending through said aperture,

a module secured to one end of the cord and comprising:

a housing of insulative material having a first end secured to said cord, a second translucent end and a central cavity extending between said ends,

a cylindrical battery disposed in said cylindrical cavity with the center pole piece thereof positioned toward said second end,



a helical compression spring of conductive material positioned around and out of contact with said pole piece and contacting the battery end wall, and

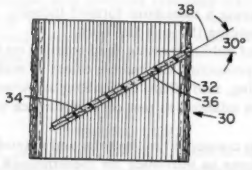
a small incandescent lamp having a base, a bulb and a terminal end, which base is positioned within and engages said compression spring with said terminal end positioned adjacent and aligned with said pole piece, said spring having a normal length sufficient to maintain said terminal end spaced from said pole piece and said spring having sufficient elasticity to permit said battery to move toward said bulb to contact the pole piece with the terminal end of said bulb and light the same when the battery is subject to centrifugal force, forcing it toward said second end.

3,971,159

TREATMENT OF CONIFERS

Claud Lafayette Brown, Watkinsville, Ga., and Herman Isaac Enos, Jr., Pennsbury Township, Chester County, Pa., assignors to Hercules Incorporated, Wilmington, Del.

Filed Feb. 5, 1975, Ser. No. 547,310
Int. Cl.² A01G *23/10*, *29/00*
U.S. Cl. 47—10 **18 Claims**



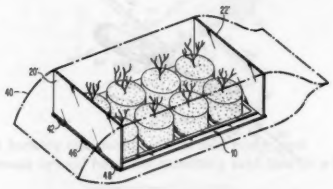
1. In the method of applying a treating chemical to a living conifer wherein the conifer is provided with a treatment site on the bole thereof, the improvement which comprises preparing a treatment site by cutting into sapwood of the conifer one elongated hole and inserting into the hole absorbent fibrous material to carry said treating chemical, the axis of said elongated hole having a vertical angle of from about 5° to 45° and a horizontal angle of from about 20° to about 30°, the hole being of a length sufficient to provide a sector angle of from about 110° to about 135°.

3,971,160

ENVIRONMENTAL PACKAGE

Leslie Vajtay, 215 Davidson Ave., Somerset, N.J. 08873

Filed Nov. 18, 1974, Ser. No. 524,563
Int. Cl.² A01G *9/10*
U.S. Cl. 47—34.11 **4 Claims**



1. An environmental package adapted for compact transportation of organic matter and for subsequent formation of an enlarged enclosed chamber with adequate room for plant growth, comprising:

a support base including a plurality of compartments adapted to retain liquid, each said compartment having upwardly extending sidewalls and a bottom surface;

a pair of end panels attached to said support base and in a first position folded flat over said support base in a plane substantially parallel with the bottom surface of each said compartment, and in a second position folded upright in a plane substantially perpendicular to the bottom surface of each said compartment;

each said end panel having end sections foldable in a plane perpendicular to both the remaining portion of said end panels and the bottom surface of each said compartment, each said end section having a depending locking means for engaging said support base;

each said end panel having, in said second position, a vertical dimension substantially greater than the vertical dimension of said organic matter, the vertical dimension of each said end panel being substantially equal to at least the greatest height of anticipated plant growth within a subsequently formed enlarged enclosed chamber, thereby forming an intermediate structure; and

transparent bag means, said intermediate structure being inserted in said bag means which is supported by said pair of end panels, completing the enlarged enclosed chamber with adequate room for plant growth.

3,971,161

PRODUCTION OF HYBRID SWEET CORN

Peter A. Bonucci, Northfield, Minn., assignor to Northrup, King & Co., Minneapolis, Minn.

Filed May 27, 1975, Ser. No. 580,963
Int. Cl.² A01H *1/02*
U.S. Cl. 47—58 **4 Claims**

1. A method for producing hybrid sweet corn seeds in commercial quantities comprising the steps of:

a. planting a row of normal sweet corn, homozygous for su_1, wherein said sweet corn can be genotypically represented as follows: $su_1su_1Sh_2Sh_2$;

b. planting a row of sugary-shrunken corn in cross-breeding proximity to said row of normal sweet corn, wherein said sugary-shrunken corn can be genotypically represented as follows: $su_1su_1sh_2sh_2$;

c. detasseling one of the two rows of plants resulting from steps (a) and (b), whereby the detasseled row serves as a female parent and the row with tassels remaining intact serves as a male parent;

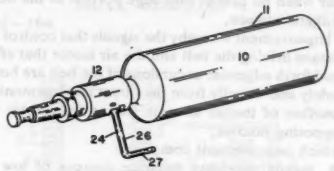
d. harvesting the F_1 ears of corn of the detasseled row to obtain commercial quantities of hybrid sweet corn from said ears of corn, said hybrid sweet corn seeds obtained from said F_1 ears of corn being heterozygous and genotypically represented as: $su_1su_1Sh_2Sh_2$.

3,971,162

PORTABLE SPARK PLUG CLEANER

Joseph L. Bellsmith, 12612 Sungrove Circle, Garden Grove, Calif. 92640

Filed June 5, 1975, Ser. No. 584,207
Int. Cl.² B24C 3/34
U.S. Cl. 51—8 SP 2 Claims



1. A portable spark plug cleaning device comprising:
   a. a gas pressurized, grit dispensing container having a normally closed, top discharging, reciprocating nozzle valve extending from a forward boss; and
   b. a spark plug adaptor assembly engaged on said forward boss;

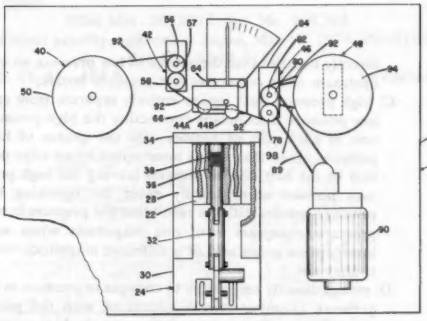
wherein the spark plug adaptor assembly comprises:
   a. a rod having an axial bore therethrough;
   b. a radial annular recess in the forward end of said axial bore;
   c. a resilient ring seal located in said radial annular recess;
   d. a controlled inside diameter in the aft end of said axial bore whereby said inside diameter may be engaged on said forward boss;
   e. a substantially "L" shaped valve actuator rod pivotally mounted to said spark plug adaptor.

3,971,163

ABRASIVE TAPE APPARATUS FOR CONTOURING A FLEXIBLE LENS

Wayne E. Trombley, and Lawrence R. Jacobson, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Dec. 23, 1974, Ser. No. 535,870
Int. Cl.² B24B 13/00, 21/02
U.S. Cl. 51—62 1 Claim



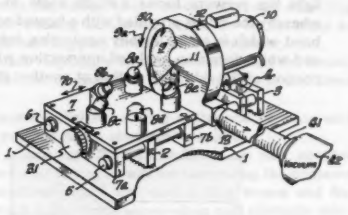
1. An apparatus for machining an article formed of a non-rigid material comprising an abrasive tape having an article engaging area, abrasive tape carrying and moving means including means for oscillating the article engaging area of the abrasive tape through an arc; and article holding means having means for moving the article into engagement with the abrasive tape, the tape being unsupported except at points spaced from the article engaging area during engagement of the article with the tape.

3,971,164

BOWLING BALL RESURFACING MACHINE

Merritt Timothy Albin, 6337 Bluebell Ave., North Hollywood, Calif. 91606, and James W. Benton, 3650 Mountain View Ave., Pasadena, Calif. 91109

Filed May 27, 1975, Ser. No. 580,576
Int. Cl.² B24B 11/06, 55/06
U.S. Cl. 51—129 4 Claims



1. A resurfacing machine for a bowling ball, comprising:
   a frame;
   ways on said frame;
   a carriage slidable on said ways;
   an abrasive disc and a shaft and motor means to rotate said disc mounted on said frame, the plane of said disc being perpendicular to the plane of said ways, and
   the diameter of said disc being substantial compared to the diameter of said bowling ball;
   a plurality of ball-like rollable supports for said bowling ball mounted on said carriage and disposed around a circle in a plane parallel to said ways and permitting manual rotation of said ball about any axis but preventing its translation;
   the center of said circle being displaced from the axis of said shaft in a plane parallel to said ways, the friction force of said disc acting to urge said bowling ball against said supports;
   a shroud enclosing said disc;
   an opening in said shroud for intrusion of a portion of said bowling ball and having a shape and a protruding dust-catching lip fitting closely around said portion on the trailing side;
   a tangentially-disposed exit spout on said shroud; and
   external suction exhaust means connected to said spout to withdraw dust.

3,971,165

RING MANUFACTURE, PRODUCTIVE OF FACE CONTACT SEAL

Norman M. Packard, Des Plaines, and John W. Gaines, Wheaton, both of Ill., assignors to International Harvester Company, Chicago, Ill.

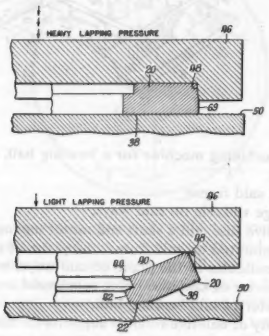
Continuation of Ser. No. 195,955, Nov. 5, 1971, abandoned, and a continuation of Ser. No. 482,309, June 24, 1974, Pat. No. 3,913,199. This application June 30, 1975, Ser. No. 591,787
Int. Cl.² B24B 5/36, 37/04, 51/00
U.S. Cl. 51—131 9 Claims

1. Apparatus for lapping against lapping surface means the side of a split torsion piston ring which, when torsionally distorted by pressure bringing the torsion piston ring into collapsed state conforming to a bore size for which it is normally designed, becomes closed or substantially so, and which, when worked while so torsionally distorted, has at one stage the inner periphery only of said side of the ring projecting into local contact with the confronting lapping surface means, said apparatus comprising:
   a ring fixture having open mouth means for receiving the ring to establish the lapping contact aforesaid;

a lap surface confronting said mouth means in spaced apart relation to the ring fixture;

said mouth means having approximately bore size to insure retention of the ring substantially precisely in collapsed state at all times;

a power cylinder having a compressive-force-transmitting connection to said fixture, effectively with the mouth means of the latter holding the ring relative to the lap surface so that at one stage said side of twisted and under light lap pressure forms a slight angle to said surface whereby the side is provided with a lapped narrow sealing band which is at the locally contacting inner periphery and which forms an angle of intersection with the major portion of the side, and so that at another stage said side



if distorted under heavy lap pressure has the major portion thereof compressed untwisted into flattened state against said surface while so collapsed;

means for causing relative movement between the fixture and lap surface in at least one direction of lap; and

separate means of two-stage, fluid pressure connection to the power cylinder from respectively a source of light fluid pressure and a source of heavy fluid pressure, whereby at said one stage light fluid pressure in the cylinder causes the lapping force exerted by the ring fixture on the inner periphery of the ring to be limited to a light pressure force, and at said other stage heavy fluid pressure causes the ring fixture to exert a heavy pressure lapping force on said flattened major portion of the ring side.

3,971,166
BELT POSITION SENSOR FOR WIDE BELT SANDING MACHINE

Gerald E. Habeck, Princeton, and Fred W. Kiser, Hopkins, both of Minn., assignors to Timesavers, Inc., Minneapolis, Minn.

Filed June 9, 1975, Ser. No. 585,063
Int. Cl.² B24B *21/18*
U.S. Cl. 51—135 BT **2 Claims**

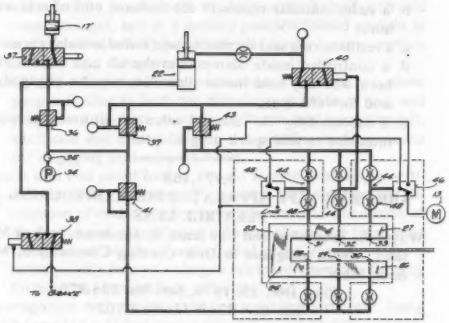
1. In a belt-type abrading machine wherein power means drives an endless abrasive belt orbitally along a defined path which includes a substantially straight stretch, and an air motor effects back and forth edgewise excursions of the belt within the bounds of a predetermined tracking zone, wherein said air motor is controlled by signals resulting from the detection of the presence or absence of an edge portion of said stretch of the band by first sensor means in the form of paired opposing low pressure and high pressure air discharge nozzles so disposed with respect to one another and said edge portion of the belt that streams of air issuing from said nozzles unrestrictedly impinge upon one another when no part of said edge portion of the belt is interposed between the nozzles, and wherein the power means driving the belt is controlled by signals resulting from the detection of the presence or absence of an edge portion of said stretch of the belt by second sensor means in the form of two pairs of opposing low pressure and high pressure air discharge nozzles spaced apart transversely of said stretch of the belt and so disposed with respect to said edge portion of said stretch of the belt that streams of air issuing from the opposing low pressure and high pressure nozzles of each pair thereof unrestrictedly impinge upon one another when no part of said edge portion of the belt is interposed therebetween,

the improvement whereby the signals that control the power means driving the belt and the air motor that effects back and forth edgewise excursions of the belt are both derived solely and directly from the direct impingement upon one another of the air streams issuing from their respective opposing nozzles,

and which improvement comprises:

A. means providing separate sources of low and high pressure air;

B. low pressure duct means connecting the low pressure one of each pair of nozzles with the source low pressure air, each of said separate low pressure duct means including means defining pressure chamber means



directly in series with the source of low pressure air and upstream of its respective low pressure nozzle;

C. high pressure duct means entirely separate from said low pressure duct means connecting the high pressure one of each pair of nozzles with the source of high pressure air so that unless intercepted by an edge portion of the belt, the air streams leaving the high pressure nozzles unrestrictedly enter the opposing low pressure nozzles with the result that the pressure in said pressure chambers is of one magnitude when such interception exists and of a different magnitude when it does not;

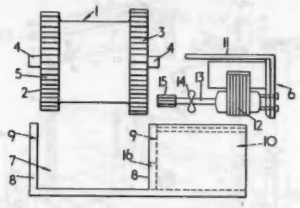
D. means directly responsive to changes in pressure in the pressure chamber means associated with the paired nozzles of the first sensor means operatively connected with said air motor operable to translate the detection of such changes into forces by which the functioning of said air motor is controlled; and

E. means directly responsive to changes in pressure in the pressure chamber means associated with the paired nozzles of the second sensor means operatively connected with said power means and operable to translate the detection of such changes into forces by which the functioning of said power means is governed.

3,971,167
TUMBLING APPARATUS

Michael van Moppes, Lilac Cottage, Alresford, Hampshire, England

Continuation of Ser. No. 429,845, Jan. 2, 1974, abandoned. This application June 11, 1975, Ser. No. 586,012
Claims priority, application United Kingdom, Feb. 28, 1973, 9852/73
Int. Cl.² B24B *31/02*
U.S. Cl. 51—164 **8 Claims**

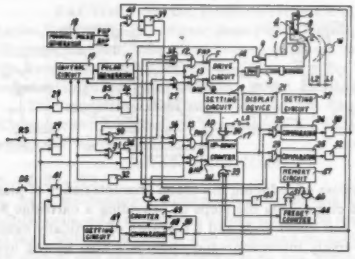


1. Tumbling apparatus comprising
a circular sectioned tumble-barrel,
two mutually exclusive external peripheral drive surfaces of different diameters formed about said barrel and spaced equally from the longitudinal center of said barrel,
a base member for said barrel,
drive means supported on said base member for engaging one of said mutually exclusive drive surfaces to directly rotate said barrel, and
mounting means secured to said base member for supporting said barrel for rotation about its longitudinal axis so that the axial orientation of the barrel may be reversed to provide for alternative engagement of a selected one of said drive surfaces with said drive means to rotate said barrel at two alternative speeds of rotation of said barrel for a given speed of rotation of the drive means.

3,971,168
CONTROL APPARATUS FOR A MACHINE TOOL

Hideo Nishimura, Kariya, and Ikuo Otsu, Toyota, both of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 20, 1975, Ser. No. 560,365
Claims priority, application Japan, May 17, 1974, 49-55198
Int. Cl.² B24B *51/00*
U.S. Cl. 51—165.8 **10 Claims**



1. Control apparatus for a machine tool having a tool support supporting a tool for machining a workpiece and movable relative to said workpiece comprising:
a pulse generating means for generating a train of pulse signals;
a drive motor operatively connected to said tool support for moving said tool support relative to said workpiece in response to said pulse signals;
first means including a manually operated switch for causing said drive motor to be actuated to move said tool support away from said workpiece toward an original position;
detecting means actuated when said tool support is moved into the original position;
second means responsive to the actuation of said detecting means for causing said drive motor to be actuated to move said tool support toward said workpiece;
counter means responsive to said second means for counting the number of said pulse signals supplied to said drive motor;
setting means for digitally setting a distance between said original position and a start position; and
comparing means operatively connected to said counter means and said setting means for comparing the contents of said counter means and said setting means and for generating a coincidence signal when said contents coincide to stop the movement of said tool support to thereby position said tool support at the start position.

3,971,169
METHOD FOR REPAIRING SELENIUM PHOTORECEPTORS

John Frank Byrne, Worthington, Ohio, assignor to Xerox Corporation, Stamford, Conn.

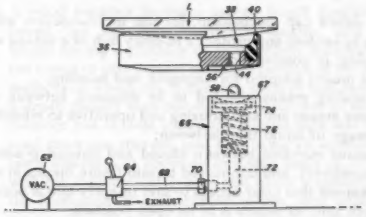
Filed Oct. 4, 1974, Ser. No. 512,803
Int. Cl.² B24B *37/04*
U.S. Cl. 51—283 **5 Claims**

1. A method for repairing a damaged area on a selenium photoreceptor comprising:
a. providing a polish composition including (i) magnesium hydroxide, (ii) a secondary suspending agent selected from the group consisting of colloidal silica particles and silica aerogels, and an abrasive, all three materials being suspended in a liquid medium of water and isopropyl alcohol;
b. applying the polish composition to a physically damaged area of a selenium photoreceptor; and
c. rubbing the polish composition about the damaged area so as to effect a smoothing of the physically damaged area of the photoconductor.

3,971,170
VACCUM CHUCK WITH SEALABLE CAVITY

Orin W. Coburn, and Joe D. Stith, both of Muskogee, Okla., assignors to Coburn Optical Industries, Inc., Muskogee, Okla.

Division of Ser. No. 322,232, Jan. 3, 1973, Pat. No. 3,874,127. This application Jan. 17, 1975, Ser. No. 541,977
Int. Cl.² B24B *1/00*
U.S. Cl. 51—284 **2 Claims**



1. The method of blocking a lens blank to a block member having a base with an aperture therethrough and a side wall mounted on said base and adaptable to receive a resilient

member for supporting a lens blank on the periphery thereof and including an elastomeric plug with a nipple means on one side thereof for insertion in said aperture by a plug inserting means having an interior cavity adapted to accept a vacuum and a spring-biased platform within said cavity comprising the steps of,

placing said elastomeric plug, nipple side up, upon said platform,

positioning a surface of said lens blank on said resilient means in sealable engagement therewith,

setting the aperture of said block member over said nipple so that said lens block and said plug inserting means form a vacuum seal around said plug,

evacuating the chamber defined by said base, said resilient member and said lens surface by drawing a vacuum through said aperture, around said elastomeric plug, and into the cavity of said plug inserting means, and

sealing said aperture with said elastomeric plug by introducing atmospheric pressure into said cavity thereby forcing said elastomeric plug into said aperture and forming a vacuum seal therewith.

3,971,171

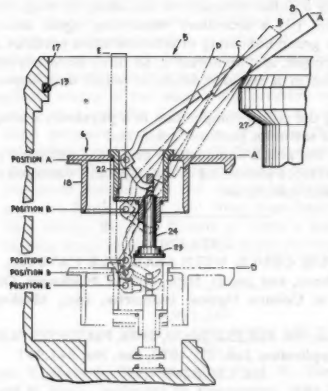
DEBRIS CAP MECHANISM FOR A SUBSEA WELLHEAD

Norman J. Wood, San Jose, Calif., assignor to Subsea Equipment Associates, Hamilton, Bermuda

Filed July 8, 1975, Ser. No. 594,012

Int. Cl.² E04D *29/14*

U.S. Cl. 52—19 **7 Claims**



1. A debris cap mechanism, for use in connection with a housing to enclose and protect a re-entry hub of a subsea well, comprising, in combination:

frame means adapted for engaging said housing;

first sealing means adapted to be disposed between said frame means and said housing and operative to inhibit the passage of liquid therebetween;

lid means movable between closed and opened positions, respectively, and connected to said frame means in such a manner that clear access to said re-entry hub is possible when said lid means is in its open position;

second sealing means adapted to be disposed between said frame means and said re-entry hub and operative to inhibit the passage of liquid therebetween, said frame means being movable and operative for moving said lid means between its closed and open positions.

3,971,172

PREFABRICATED CONSTRUCTION

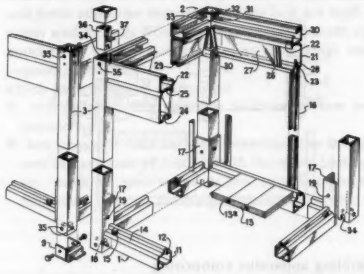
Robert Gentil, Paris, France, assignor to Industrielle de Constructions Mobiles, Paris, France

Filed May 6, 1975, Ser. No. 574,965

Claims priority, application France, May 8, 1974, 74.15948; May 8, 1974, 74.15949; May 8, 1974, 74.15950; May 8, 1974, 74.15951

Int. Cl.² E04G *1/02*

U.S. Cl. 52—28 **26 Claims**



1. A metal framework for a prefabricated construction, comprising a lower structure and an upper structure and vertical uprights, the lower structure and upper structure each comprising a frame having a substantially rectangular shape, a vertical corner member provided at each corner of the frame, the vertical corner members of the upper structure being engaged with upper parts of the uprights and the vertical members of the lower structure being engaged with lower parts of the uprights, each of said vertical members and the corresponding upright comprising complementary detachable means for fixing and guiding the vertical member and uprights, wherein the fixing and guide means comprise screwthreaded rods carried by the corner members and notches provided respectively at lower and upper ends of the uprights, and nuts screwed tight on the screwthreaded rods so as to achieve the fixing.

3,971,173

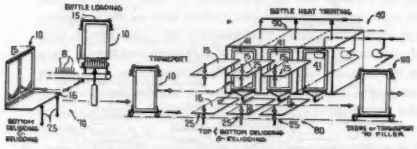
PROCESS FOR HEAT TREATING PLASTIC BOTTLES

Kenneth F. M. Friendship, Hinsdale, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Division of Ser. No. 246,716, April 24, 1972, Pat. No. 3,886,253. This application Feb. 18, 1975, Ser. No. 550,570

Int. Cl.² B29C *17/07, 25/00;* B65B *43/00*

U.S. Cl. 53—29 **8 Claims**



1. A process of reducing the creep characteristics of plastic containers comprising the steps of providing a cartridge having upper and lower ends and a plurality of vertically extending transversely interconnected chambers also having upper and lower ends, blow molding a plurality of containers, stacking the blow molded containers vertically upwardly through the lower ends of the chambers toward the upper ends thereof atop and in contact with each other in an upright position in each chamber, transferring the cartridge into a heat treatment bay, circulating hot air in contact with the plastic containers in a direction upwardly from and through the lower ends

through the upper ends in open condition and through and between the chambers for a predetermined period of time and at a predetermined temperature sufficient to reduce the creep characteristics of the plastic containers, and removing the cartridge from the heat treatment bay.

3,971,174

PREFABRICATED BUILDINGS

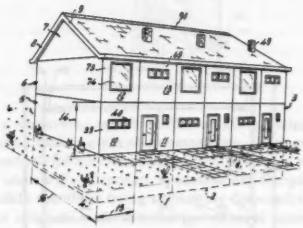
Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Filed Jan. 16, 1973, Ser. No. 324,078

Claims priority, application Netherlands, Jan. 17, 1972, 7200627

Int. Cl.² E04H *1/00*

U.S. Cl. 52—79 **22 Claims**



1. A row of houses wherein each house comprises a foundation defining a basement having a furnace, and a staircase, each house consisting of four parallelepiped elongated prefabricated units with two of said units of the first floor supported by said foundation over said basement in a connecting side-by-side arrangement and two further units of the second floor each supported by an underlying first mentioned unit, said second floor units also being connected in a side-by-side arrangement, said units together forming a box-shaped structure, the longitudinal axis of each unit being perpendicular to the front of the house, the front of the house having an entrance into the hall and kitchen beside the hall, a stairwell is provided for said staircase from the basement immediately behind said kitchen whereby said staircase communicates with said hall, the living room spanning the first floor units after said hall and said stairwell behind said kitchen and including a stairway, and landing receiving said stairway included in a unit of said second floor, said second floor units further defining three rooms having entrances from said landing and bathroom also having an entrance from said landing disposed at the head of said stairway is said unit including said landing.

3,971,175

FACTORY-MADE HABITATION CELL

Charles Boël, Bully-Les-Mines; Jean-Pierre Cottin, Lens, and Francois Guitard, Lille, all of France, assignors to Houilleres du Bassin du Nord et du Pas-de-Calais, France

Continuation of Ser. No. 485,216, July 2, 1974, abandoned.

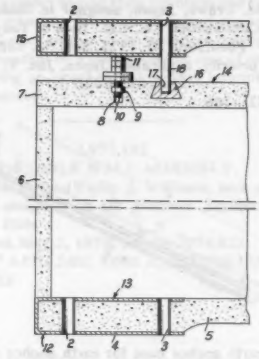
This application Oct. 28, 1975, Ser. No. 626,181

Claims priority, application France, July 3, 1973, 73.24465; June 13, 1974, 74.20608

Int. Cl.² E04B *1/348*

U.S. Cl. 52—79 **6 Claims**

1. In a multi-story building structure having superposed modular cells, each cell having a floor slab, walls supported on said floor slab and a ceiling slab supported on said walls, the floor slab of one cell being spaced from and aligned with the ceiling slab of an underlying cell, the improvement which comprises in combination a floor slab of reinforced concrete and generally rectangular, a plurality of metal L-shaped corner pieces each bonded to said floor slab at a corresponding corner thereof, each corner piece having a pair of legs in the form of channels with generally U-shaped transverse cross sections, respective edge portions of the floor slab being received inside the channel openings of said legs, each leg having an upper outside surface and a lower outside surface, at least one tubular member connected to each corner piece and extending through the floor slab and a leg of the corner piece, a ceiling slab of reinforced concrete, spacer means received in



said ceiling slab and disposed for engagement with a lower outside surface on a corner piece leg of the floor slab of an overlying cell to establish a given spacing between said ceiling slab and such floor slab, and alignment means received in said ceiling slab and received inside a tubular member associated with the floor slab of said overlying cell to establish a given alignment between such floor slab and said ceiling slab.

3,971,176

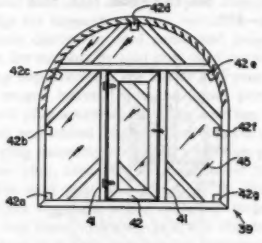
STUD-TRUSS AND METHOD OF MAKING SAME

Lynn Lee Rannels, R.D. 2, Reinholds, Pa. 17569

Filed Feb. 5, 1975, Ser. No. 547,332

Int. Cl.² E04B *1/32*

U.S. Cl. 52—86 **3 Claims**



1. A permanently formed stud-truss comprising

a. a wood member having a curved length positioned between two substantially straight lengths, said curved length having a plurality of substantially parallel cuts on the concave side thereof at least a portion of the adjacent surfaces of which are in contact, each of said cuts having a depth greater than one-half the thickness of said wood member but at least about one-quarter inch less than the total thickness thereof, said cuts being all inclined in the same direction at about an included angle of 30° to 80° with the longitudinal axis of said wood member prior to the formation of said curved length, said angle being measured on the wood member surface containing partial cuts, and

b. a hardened adhesive material between each of said adjacent surfaces permanently maintaining at least the open ends of the adjacent surfaces of each of said cuts substan-

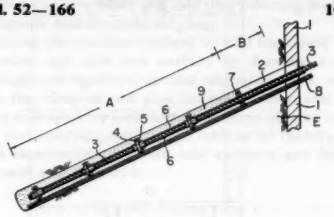
tially in contact whereby said stud-truss permanently retains a desired form.

3,971,177

EARTH ANCHOR WORK METHOD AND ANCHOR DEVICE

Yuzo Endo, Urawa, Japan, assignor to Shoichi Kimura and Mitsui Construction Co., Ltd., both of Tokyo, Japan

Filed June 20, 1975, Ser. No. 588,656
Claims priority, application Japan, Jan. 9, 1975, 50-4655
Int. Cl.² E02D *5/74*
U.S. Cl. 52—166 **10 Claims**



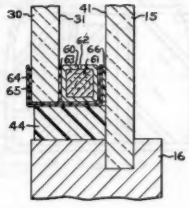
2. An earth anchor base for earth anchor insertable into a bore of suitable depth provided at the anchor position in the earth, the improvement residing in that a plurality of flanged load-resistant plate couplers are mounted at any desired intervals axially on a Tendon providing the core portion of the anchor, a spring mechanism is closely annexed to the load-resistant surface of each of said flanged load-resistant plate couplers, and sheath materials cover the portions of said Tendon which are exposed.

3,971,178

ADD-ON MULTIPLE GLAZING WITH HYGROSCOPIC MATERIAL

Renato J. Mazzoni, Tarentum; George H. Bowser, New Kensington, and Richard R. Lewchuk, Allison Park, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 25, 1974, Ser. No. 454,338
Int. Cl.² E06B *7/12, 3/28*
U.S. Cl. 52—172 **32 Claims**



1. An architectural glazing unit for converting installed glazing to multiple glazing, comprising:

no more than one transparent pane;

an elongated spacer element adjoining marginal portions of a first major surface of said pane around the perimeter of said pane, each longitudinal portion of said spacer element having a first surface and a second surface on opposite sides thereof, wherein said first surface faces said marginal portions of said pane in adjoining relationship thereto, and said second surface faces outwardly, away from said marginal portions of said pane;

a ribbon of essentially moisture vapor impervious material extending around the perimeter of the unit adhered to said second surface of said spacer element and overlying peripheral edge surface portions of said pane; and

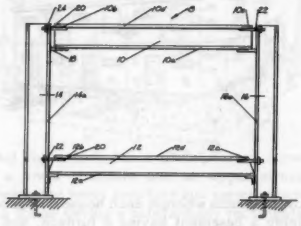
moisture-resistant sealant interposed between said ribbon and edge surface portions of said pane so as to provide adhesion and a hermetic seal therebetween.

3,971,179

NON-BONDED FRAMING SYSTEM

Andrew Bodocsi; John H. Hoge; John H. Hubbard; S. Jackson Hubbard, and Gerard Roberto, all of 4204 Airport Road, Cincinnati, Ohio 45226

Continuation-in-part of Ser. No. 849,787, Aug. 13, 1969, abandoned. This application Mar. 2, 1971, Ser. No. 120,123
Int. Cl.² E04C *3/10;* E04B *1/06*
U.S. Cl. 52—223 R **14 Claims**



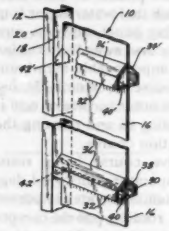
1. A non-bonded, prestressed, rigid frame structure providing post-tension and resulting camber in all flexural members comprising beam members and at least three spaced column members with each said beam member being joined at each of its end faces to a side face of one of said column members by post-tensioned, moment-transferring connections, said beam members each having at least one adjustable tension connecting element and at leastt one compression connecting element on the end faces thereof, said column members each having corresponding tension and compression connecting elements on the side faces thereof for mating with said connecting elements on the end faces of said beam members, said mating connecting compression elements comprising the distending edge of a bias cut end face of said beam members engaging a compression bearing surface on a side face of said column members in unattached abutment to cause a spacing apart of said joined end and side faces at the locations of said mating tension connecting elements and serving as compression fulcrums for unrestricted relative rotation between saidd joined end and side faces, and said adjustable mating tension connecting elements comprise at least one threaded rod attached to the upper portion of the end faces of said beam members and extending therefrom through corresponding apertures in the spaced apart side faces of said column members, and secured thereto by nuts, and resistance to said relative rotation comprising only the deadweight of said members and their connections at the other ends of said beam and column members, whereby the tightening of said nuts produces and secures controlled relative rotation about said compression fulcrums between respective pairs of said joined members and tensions and cambers all of said joined beam and column members of said frame structure and renders said connections therebetween capable of immediate moment transfer and said frame structure capable of supporting vertical and horizontal service loads in rigid frame action.

3,971,180

WALL STRUCTURE

Charles V. Frederick, Rte. No. 5, Box 132, New Virginia, Iowa 50210

Filed Oct. 25, 1974, Ser. No. 517,881
Int. Cl.[2] E04B 1/16, 2/34
U.S. Cl. 52—251 4 Claims



1. In a concrete, reinforceable metal building structure having metal building panels, comprising, a first panel of

U-shaped metal side members each having a web portion and outwardly disposed spaced-apart flange members, said side members being oppositely disposed in a spaced-apart relation with the flanges thereof extending outwardly in opposite directions,

a plurality of metal sheet members extending between said web portions and being secured thereto, and pairs of metal stiffener members extending between said side members on opposite sides of said sheet members and covering the adjacent edges of adjacent sheet members, said metal stiffener members having a beveled outer surface so that particulate material will not lodge thereon when said panel is in a vertical position; said stiffener members forming an enclosed compartment along the adjacent edges of adjacent sheet members,

said webs having openings formed therein at the ends of said compartments,

a second building panel of like description is aligned with said first panel so that the outwardly extending flanges of said panels are aligned to form a column compartment,

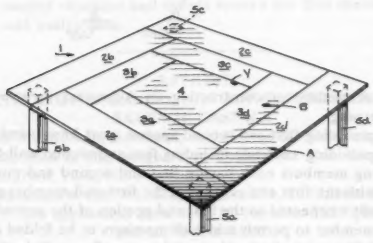
and hardened concrete material positioned within said column compartments and the enclosed compartments formed by said stiffener members creating an interconnecting rigid structure member with said panels.

3,971,181

BEAMLESS FLOOR AND ROOF STRUCTURE

Lev Zetlin, 89 Hamilton Drive, Roslyn, N.Y. 11576

Filed Apr. 4, 1974, Ser. No. 457,982
Int. Cl.[2] E04B 5/08
U.S. Cl. 52—263 16 Claims



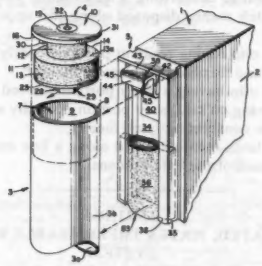
1. A beamless floor structure comprising a plurality of elongated plate members cooperating to form a closed ring means, each of said plate members having an end portion supported by a longitudinal edge portion of the next succeeding one of said plate members and having a longitudinal edge portion supporting an end portion of the next preceding one of said plate members when viewed in one direction around said closed ring and not in the other, and a plurality of support means equal in number to said plate members and cooperating with said plate members for supporting said ring means at a given elevation, each of said plate members having a second end portion supported by a corresponding one of said support means and having an unsupported portion intermediate said end portions thereof.

3,971,182

PORTABLE WALL ASSEMBLY

Charles R. Donahue, and Philip J. Williams, both of Youngstown, Ohio, assignors to GF Business Equipment, Inc., Youngstown, Ohio

Filed May 2, 1975, Ser. No. 574,023
Int. Cl.[2] A47G 5/00; E04B 2/82; E04F 13/08
U.S. Cl. 52—282 12 Claims



1. A portable wall assembly including, a panel element having a vertical side edge, an upright post disposed adjacent said panel edge for supporting same, vertically spaced apart mounting means carried by said panel and projecting from said side edge for support by said post, said mounting means including a top clip overlying the top of said post and having a depending tongue inserted into the upper portion of said post, a cap and plug assembly securing said top clip tongue against vertical and lateral displacement relative to said post, said cap and plug assembly including a top cap plate affixed to a connector plug, said plug of elastomeric material and disposed within said post and including an upper smaller diameter portion disposed above a lower larger diameter portion, said cap plate overlying said top clip tongue when inserted into said post with said tongue disposed above said lower larger diameter portion, and means operable from outside said cap and plug assembly to vertically compress and laterally expand said elastomeric connector plug to retain said cap plate in locking engagement atop said panel top clip as said lower larger diameter portion of said plug is expanded to engage the interior of said post.

3,971,183

INTERLOCKING CLIPS AND RAFTERS FOR ROOF PANELS

Henry Padleckas, 815 N. Oak Ave., Oak Park, Ill. 60302 and Ludwig Wenzlow, 507 Longfellow Dr., Deerfield, Ill. 60015

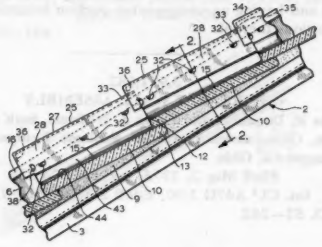
Filed July 2, 1973, Ser. No. 375,604
Int. Cl. E04b 1/40
U.S. Cl. 52—478 7 Claims

1. A hold-down clip and rafter combination for securing roof panels;

a rafter having catch means extending longitudinally thereof,

means for supporting said panels against said rafter beneath said catch means,

and clips having means for engagement with said catch means and slidable thereon lengthwise of said rafter into wedging securing engagement between said catch means and associated panels therebeneath;



and said rafter comprising a longitudinal vertical web and said catch means disposed along the upper edge of the web,

and each clip having resilient portions overlying respective panels and flexible transversely thereof;

and each clip having a body portion sleeved over the web and having on said body portion inwardly extending projections constituting latch means;

and said latch means located along a line converging with the planes of the catch means.

3,971,184

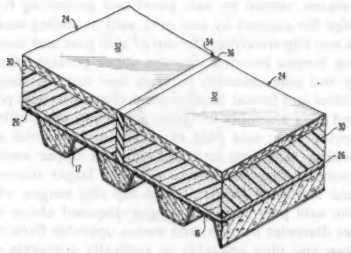
INSULATED, WATER IMPERMEABLE ROOFING SYSTEM

John D. Van Wagoner, McLean, Va., assignor to Robert M. Barlow, Fairfax, Va., a part interest

Filed Mar. 5, 1975, Ser. No. 555,596

Int. Cl.[2] E04C *2/00*; E04B *1/62*

U.S. Cl. 52—613 **2 Claims**



1. A factory assembled, insulated, water impermeable, roofing panel for use in a roofing system to insulate the interior of a building from ambient thermal cycling and for insuring water impermeable integrity of a roof or deck portion of the building; said roofing panel being laminated and comprising:

a water and vapor impermeable membrane, said membrane comprising a course of water and vapor impermeable material and having one surface thereof operably bondable to a roof deck for insuring water impermeable integrity of a roof or deck portion of the building;

an insulation course coextensively overlaying and evenly extending to and meeting the peripheral margins of said course of water and vapor impermeable material,

said insulation course serving to isolate said water and vapor impermeable membrane as well as the roof or deck surface to which the membrane is applied from ambient thermal cycling and from exposure to the surrounding environment which may tend to degrade the water and vapor impermeable character of the membrane material, and

said insulation course coextensively overlying and evenly extending to and meeting the peripheral margins of said course of water and vapor impermeable material having a vapor permeability greater than the vapor permeability of said course of water and vapor impermeable material such that water vapor trapped within the laminated roofing panel will pass outwardly through said insulation course away from the building and said water and vapor impermeable membrane; and

a protective course coextensively overlying and bonded directly to the outer surface of said insulation course and evenly extending to and meeting the peripheral margins of said insulation course,

said protective course being resistant to ultra-violet, ozone, temperature and wind degradation and further being substantially water impermeable;

said laminated roofing panels composed of a water and vapor impermeable membrane, an insulation course and an overlaying protective course each evenly extending to and meeting adjacent peripheral margins of a juxtaposed course such that said panels are operable to be positioned in a posture mutually juxtaposed but laterally spaced from one another upon a roof or deck portion of a building to form a peripheral zone around each panel and being operable to receive within the peripheral zone thus formed a water and vapor impermeable compound which operably bonds to the roof or deck portion of the building, the peripheral margin of a water and vapor impermeable membrane, the peripheral margin of the insulation course, and the peripheral margin of the protective course to form a water and vapor impermeable barrier across the entire roof deck and concomitantly to form an expansion zone or joint about the peripheral edges of each of the roofing panels.

3,971,185

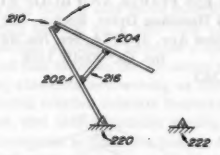
METHOD OF ERECTING A FOLDABLE BUILDING MODULE

John H. Hendrich, 5 W. 10th St., Erie, Pa. 16501

Continuation-in-part of Ser. No. 332,677, Feb. 15, 1973, Pat. No. 3,863,419, which is a continuation-in-part of Ser. No. 178,942, Sept. 9, 1971, abandoned. This application Aug. 23, 1974, Ser. No. 500,085

Int. Cl.[2] E04B *1/344*; E04G *21/14*

U.S. Cl. 52—745 **7 Claims**



1. A method of constructing an A-frame type structure comprising:

a. providing first and second spaced apart base members;

b. providing a module including first and second wall-defining members each having first and second end portions with the first end portion of the first wall member pivotally connected to the first end portion of the second wall member to permit said wall members to be folded about a first axis to lie in side-by-side generally parallel relationship;

c. positioning said module in its folded condition to lie in a generally horizontal position with the second wall mem-

ber subjacent the first wall member and connecting the second end portion of the second wall member to the first base for pivotal movement about a second axis parallel to said first axis with second end portion of the first wall member extending generally toward said second base;

d. lifting said first wall member to pivot it about said first axis and moving the second end portions of said wall members a distance apart substantially equal to the distance between said base members;

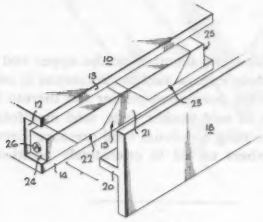
e. providing a floor member and with said first wall member in the lifted position interconnecting said first and second members with said floor member extending therebetween; and,

f. thereafter lifting said module to rotate it about said second axis to move the second end of said first wall member into engagement with said second base.

3,971,186
WEDGE LOCK UNIT

Steven E. Havelka, Playa del Rey; Paul L. Graham, Culver City, and Carl L. Matschke, Canoga Park, all of Calif., assignors to Electronic Memories and Magnetics Corporation, Los Angeles, Calif.

Filed Aug. 13, 1975, Ser. No. 604,344
Int. Cl.² F16B 5/06
U.S. Cl. 52—753 G **12 Claims**



1. In a wedge lock of the type including at least first and second separate members with mating wedged sides and operable means for selectively applying a clamping force to said members to cause relative motion between said members, with said first member being in contact with a first flange of a first structure and said second member comes in contact and clamps a flange of a second structure against a second flange of said first structure, the improvement comprising:

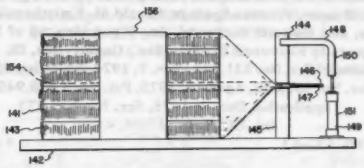
means for producing a reaction force when said clamping force is applied to said members of said wedge lock, the direction of said reaction force being opposite to the clamping force direction, whereby when said clamping force is removed, said reaction force urges said second member to become separated from the flange of said second structure and moves toward the first member of said wedge lock.

3,971,187
METHOD OF MAKING VACUUM WRAPPED SHIRRED SAUSAGE CASINGS

Frank M. McNeill, Lombard, and Harold H. Martinek, Danville, both of Ill., assignors to Continental Can Company, Inc., New York, N.Y.

Continuation of Ser. No. 438,305, Jan. 31, 1974, abandoned. This application June 4, 1975, Ser. No. 583,730
Int. Cl.² B65B 31/02
U.S. Cl. 53—21 FC **9 Claims**

1. A method for packaging a shirred artificial sausage casing which comprises enveloping said casing within a flexible tubular film, said film having a transmission rate for air of less than about 1cc/100in²/24 hr.-atm removing sufficient air from within the resulting envelope to produce therein an absolute

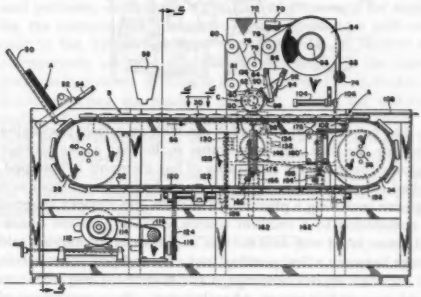


pressure of substantially not less than about 0.4 atmospheres, and then sealing said envelope for maintaining said pressure.

3,971,188
APPARATUS AND METHOD FOR APPLYING LIDS TO CONTAINERS

Richard S. Cawrse, 915 Beachside Lane, Huron, Ohio 44839

Division of Ser. No. 418,608, Nov. 23, 1973, Pat. No. 3,890,767. This application Apr. 7, 1975, Ser. No. 565,745
Int. Cl.² B65B 7/28
U.S. Cl. 53—39 **2 Claims**



1. A method of applying lids having a layer of heat sealing material on one side thereof to containers having open upper ends comprising the steps of horizontally indexing successive containers to sequentially advance said containers to a lidding position whereat a rotatably indexable heated polygonal mandrel has, in each indexed position, a bottom planar face spaced above a container at said lidding position; applying by vacuum the leading end portion of lidding material from a roll thereof to an upper planar face of said mandrel with said heat sealing layer facing upwardly and softened by contact of the other side of said lidding material with said mandrel; indexing said mandrel and the vacuum-held lidding material thereon to cutting position; transversely cutting said lidding material at the vortex between successive faces of said mandrel at said cutting position to provide a separate lid held by vacuum against the mandrel; indexing said mandrel and the separate lid thereon to lidding position; lifting the container at lidding position to engage its open upper end with the heat softened layer of the lid then held by vacuum against the bottom face of the mandrel to heat seal said lid to the upper open end of said container; and applying air pressure on the lid contacted by the lifted container while commencing to lower the container to aid in sealing the lid against the open upper end of the container, to assist in separating the lid from the bottom face of the mandrel, and to provide a cooling effect on the layer of heat sealing material.

3,971,189

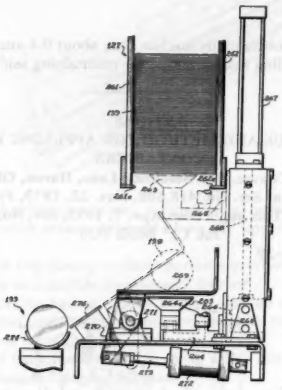
APPARATUS FOR COUNTING AND PACKAGING CAN ENDS

Wallace W. Mojden, Hinsdale; Jose E. Davila, Chicago; George W. Hooper, Western Springs; Gerald M. Kwiatkowski, Dolton, and Howard W. Pantel, Jr., Woodridge, all of Ill., assignors to Fleetwood Systems, Inc., Countryside, Ill.

Division of Ser. No. 521,842, Nov. 7, 1974, which is a division of Ser. No. 351,639, April 16, 1973, Pat. No. 3,878,945. This application Dec. 3, 1975, Ser. No. 637,473

Int. Cl.[2] B65B *57/06, 43/26*

U.S. Cl. 53—63 9 Claims



1. Bag handling apparatus for use with an article packaging device or the like, said apparatus including: a bag storage magazine for receiving a plurality of bag elements in clamped, stacked relation; means for removing a bag element from said magazine including a plurality of suction cup devices adapted for connection to a vacuum source, elevating means operatively associated with said suction cup devices for moving said devices between a first position and a second position wherein said suction cup devices engage the lowermost bag elements in said storage bag means, whereby upon return movement of said suction cup devices toward said first position a bag element will be maintained in engagement with said devices and will be removed from said storage magazine; means for opening the mouth of the bag element so removed preparatory to the disposition of articles therein, said means including a clamping arrangement positioned at the level above said first location and disposed in the path of movement of said bag element, said clamping arrangement being adapted to engage an upper portion of the bag mouth in clamped relation, such that upon movement of said bag element past said clamping arrangement, the mouth of said bag will be expended to an open condition.

3,971,190

ARTICLE TRANSFER APPARATUS HAVING RELEASABLE RODS

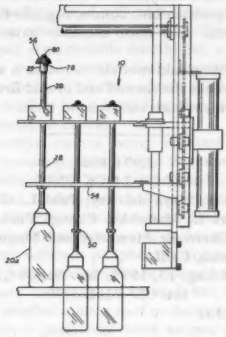
Robert W. McGill, Munroe Falls, Ohio, assignor to A-T-O Inc., Willoughby, Ohio

Filed Feb. 20, 1975, Ser. No. 551,266

Int. Cl.[2] B65B *57/00, 35/38*

U.S. Cl. 53—77 8 Claims

1. In container depositing or case packer apparatus or the like having articles fed onto a releasable support at an article processing station in a plurality of rows of abutted articles, the combination comprising a frame means, a carrier means slidably engaging said frame means for vertical movement, said carrier means extending across said support at the processing station and being thereabove, drive means engaging said carrier means to control its position and move it vertically toward and away from said support, manifold means on said carrier means and having vertical bores therein and having a fluid pressure force supplied to said bores, a plurality of vertically positioned pusher rods individually slidably engaging said bores of said manifold means and protruding therefrom in both directions but being movable as a unit with said carrier



means, and a suction cup member on the upper end of each of said pusher rods to engage said carrier means to releasably secure each operably positioned pusher rod thereto for individual movement of said pusher rods, said manifold means operatively transmitting a vacuum fluid pressure force to said suction cup members to aid in operatively positioning the same.

3,971,191

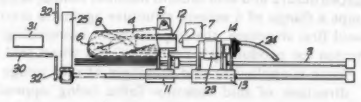
MACHINE FOR INSERTING OBJECTS INTO BAGS

Trevor Barrie Hoyland, Norwich, England, assignor to Thurne Engineering Company Limited, Norwich, England

Filed July 11, 1975, Ser. No. 594,972

Int. Cl.[2] B65B *7/12, 31/06, 43/36, 51/08*

U.S. Cl. 53—112 B 6 Claims



1. A machine for inserting objects into bags comprising a holder for a stack of bags, an object support movable back and forth between a forward position in which, in use, it is inserted together with an object supported on it, into a bag, and a retracted position, carriage means, first and second pushers mounted on said carriage means, the first pusher being operable to engage said object on said object support and push said object forwards from said object support and at the same time cause said bag to move forwards from said holder, said carriage means also being arranged subsequently to withdraw said first pusher, means for advancing said second pusher into the mouth of the bag, means for pressing said bag inwards into contact with said second pusher behind said object, a suction connection associated with said second pusher for sucking air from said bag after said bag has been pressed into contact with said second pusher, and means for closing said bag after said bag has had said air sucked from it.

3,971,192

DEVICE FOR THE DISPLACEMENT OF FILLING MATERIAL AND THE SHAPING OF A MATERIAL WEB IN A PACKING MACHINE

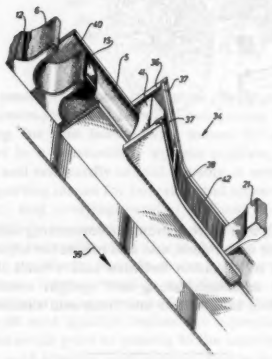
Franz Soukup, Malmo; Bengt A. Rosberg, Hoor; Tore I. Larsson, Loddekopinge, and John-Erik Brunlid, Lund, all of Sweden, assignors to Tetra Pak Development, Switzerland

Filed May 27, 1975, Ser. No. 580,724

Claims priority, application Sweden, June 28, 1974, 7408564

Int. Cl.² B65B *1/24*

U.S. Cl. 53—184 R 6 Claims



1. In a machine for forming, filling and sealing packages including movable mould means for forming a series of interconnected U-shaped sections transversely in a first longitudinal web of flexible packaging material, means for forming spaced cuts along the side edges of a second longitudinal web of packaging material to form successive edge flaps along the edges of the second web, means for successively sealing transverse pairs of said edge flaps to the side edges of each U-shaped section to form a series of interconnected cavities, a filling tube extending parallel to the tops of the U-shaped sections and beneath the center longitudinal section of the second web for filling said cavities with a filling material, said center longitudinal section of the second web being outwardly bulged to accommodate said filling tube, reciprocating means for sealing the second web transversely to the transverse outer edges of the filled U-shaped sections of the first web to form sealed packages and means for separating each of the interconnected packages, the improvement comprising pressing means disposed substantially between the end of of the tube and the second mentioned reciprocating sealing means and including a reciprocatable mat-like element movable in the direction of the moving webs, means for guiding said mat-like element angularly toward the upper outer surface of the second web and then parallel to the tops of the U-shaped sections to press the second web against the outer transverse edges of the successive U-shaped sections to flatten the bulging center longitudinal section of the second web and to displace the filling material from between the webs in the areas to be sealed and thus maintain said mat-like element against the second web until the areas are sealed by said second mentioned reciprocating sealing means.

3,971,193

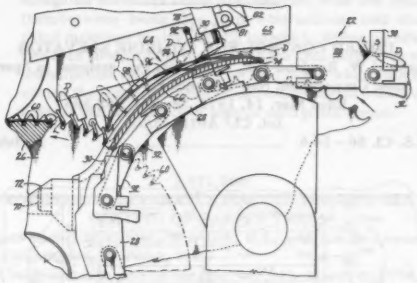
MACHINES FOR SEQUENCING DIVERSE COMPONENTS

Armand L. Tardiff, Salem; Glover F. Broughton, Marblehead; David R. Delorey, Beverly, and Bangt R. Pearson, Magnolia, all of Mass., assignors to USM Corporation, Boston, Mass.

Filed Apr. 23, 1975, Ser. No. 570,842

Int. Cl.² B65B *27/10*

U.S. Cl. 53—198 R 10 Claims



1. A machine for sequencing and interconnecting differently-shaped as well as similarly-shaped electrical components respectively having stand-off lead portions and/or only coaxial lead portions, comprising a plurality of dispensers for supplying the components, a conveyor movable along a path adjacent to the delivery ends of said dispensers to receive and continuously advance selected components with the coaxial portions in uniform spacing in the direction of feed, means for interconnecting the leads as thus fed, means for centering bodies of the successive components transversely along the path, and means ahead of the lead interconnecting means and extending adjacent to and above the conveyor for engagement with the advancing component bodies having stand-off leads for uniformly orienting them with respect to the axes of their coaxial lead portions.

3,971,194

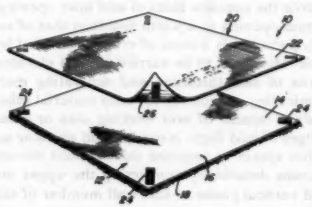
SEPARABLE DOUBLE PLY SADDLE PAD

Veldon Morgan, Box 65, Ellsworth, Nebr. 69340

Filed Apr. 15, 1975, Ser. No. 568,191

Int. Cl.² B68C *1/12*

U.S. Cl. 54—66 7 Claims



1. A multi-ply saddle pad including a first flexible lower ply having a flexible backing layer with a dense fibrous pile layer carried by the undersurface of said backing layer, said flexible lower ply being capable of being draped over the compound curvature saddle supporting back surfaces of a domestic animal to be saddled with said lower ply conforming to the compound curvature of said back surfaces, a flexible second ply overlying said first ply in at least substantial registry therewith and capable of conforming to the compound curvature of the first lower ply resulting from its being draped over said back surfaces, said first and second plies including corresponding

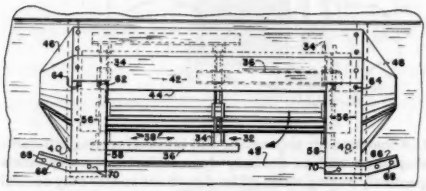
peripheral portions spaced thereabout, coacting fastener means releasably stationarily securing corresponding peripheral portions of said plies together against shifting relative to each other, said plies being free of direct connection with each other independent of said fastening means, and said fastening means including means operative to allow stationary releasable securement of said corresponding peripheral portions together in at least slightly randomly relatively shifted positions.

3,971,195

INFEED CONTROL FOR COMBINE ELEVATOR

Edward W. Rowland-Hill, Lancaster, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Mar. 14, 1975, Ser. No. 558,506
Int. Cl.[2] A01D *45/02*
U.S. Cl. 56—14.6 2 Claims



1. A combine of the axial flow type comprising crop material harvesting means mounted on the forward end of said combine and having discharge means operable to discharge cut crop material from the central part of said harvesting means, an elevator extending from said harvesting means upwardly and rearwardly thereform, axially arranged threshing and separating mechanism adjacent the upper end of said elevator and having an inlet end and including rotatable auger means extending longitudinally forward from said inlet end and receiving crop material to be threshed, said auger means having a working area centrally thereof and of less width than the width of said auger means, said elevator comprising endless flight means movable within a housing having a substantially vertical wall member provided with an inlet opening extending across said wall member at the lower end of said elevator, said opening being substantially as wide as said flight therein and the upper end of said housing having a discharge opening adjacent the inlet end of said threshing and separating mechanism; in combination with inlet restricting plates detachably connected to said wall member of said elevator housing and overlie the opposite sides of said inlet opening therein to restrict said opening to a width less than that of said flight and thereby permit only a mass of crop material of less width than said elevator flight to be carried by said elevator to said working area of said threshing and separating mechanism, thereby eliminating a tendency for crop material otherwise to become lodged outside of said working area or escape from opposite edges of said flight means of said elevator and accumulate within spaces at opposite sides of said elevator housing, and means detachably connecting the upper and lower ends of said vertical plates to said wall member of said elevator housing.

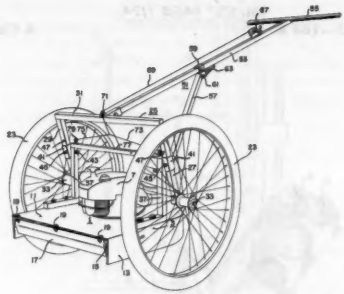
3,971,196

POWER MOWER

James S. Stevenson, 4230 St. Andrews Road, Oakland, Calif. 94605

Filed Dec. 16, 1974, Ser. No. 533,008
Int. Cl.[2] A01D *35/262*
U.S. Cl. 56—17.1 9 Claims

1. A power mower comprising a mower unit, a mobile support for said mower unit, said mobile support including a pair of wheels spaced apart a distance sufficient to receive said mower unit between them, and means for adjustably supporting said mower unit elevationally between said wheels in the vertical plane through the axes of said wheels whereby to maintain said power unit substantially balanced at its various elevational adjustments, said mobile support comprising a bridge coupling said wheels, said bridge including an upright member adjacent one wheel and an upright member adjacent



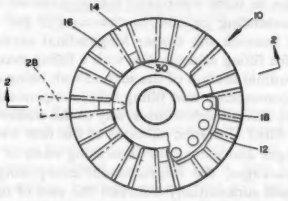
the other wheel, and a cross member connecting said upright members at their upper ends, and said means for adjusting said mower unit as to elevation between said wheels, including means slidably adjustable along said upright members and means suspending said mower unit from said slidable adjustable means.

3,971,197

COTTON DOFFER

Richard R. Batzer, Galesburg, Ill., and John D. Redmond, Littleton, Colo., assignors to The Gates Rubber Company, Denver, Colo.

Filed Jan. 22, 1975, Ser. No. 543,081
Int. Cl.[2] A01D *46/16*
U.S. Cl. 56—41 8 Claims



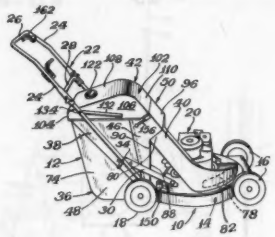
1. In a cotton doffer of the type having circumferentially spaced, integrally molded, generally radially aligned annular teeth extending from at least one generally planar side thereof, the improvement comprising:

a perforated disk substantially concentric with and embedded in the doffer along at least one annular portion of the disk to a point generally radially inward of the mid diameter of the annular teeth whereby the rim of the doffer and at least half of each annular tooth are unsupported and deflectable at least generally normal to the planar side.

3,971,198
COLLECTOR FOR A POWER LAWNMOWER

Joseph J. Lane, Thief River Falls, Minn., assignor to Arctic Enterprises, Inc., Thief River Falls, Minn.

Filed Dec. 23, 1974, Ser. No. 535,423
Int. Cl.² A01D *35/22*
U.S. Cl. 56—202 12 Claims

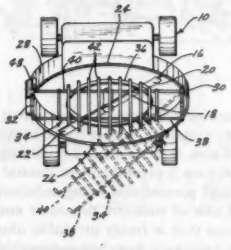


1. An assembly for collecting grass clippings, in a container, from a lawnmower, said assembly comprising, in combination, a housing for said lawnmower, means for supporting said container in a substantially upright position, with an upper opening and rearwardly of said housing, a member carried on said supporting means for covering said upper opening of said container, said covering member and said container defining a substantially enclosed chamber having an interior, spaced inlet means and outlet means located in said covering member and being positioned entirely above said upper opening, passage means interconnecting said housing with said inlet means, exhaust passage means for communicating said outlet means with said interior, means for separating solid matter from exhaust air prior to passing to the exterior of said chamber from said interior, said housing, said passage means, said covering means, and said exhaust passage means defining a substantially continuous flow path for air passing from said housing to said exterior while said clippings drop by gravity into said flexible container through said upper opening after passing through said inlet means, and means for detachably mounting at least a portion of said supporting means to selectively remove said container from said housing.

3,971,199
BLADE GUARD FOR ROTARY LAWN MOWERS

Wesley F. Buchele, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Oct. 11, 1974, Ser. No. 514,126
Int. Cl.² A01D *75/20*
U.S. Cl. 56—320.2 3 Claims

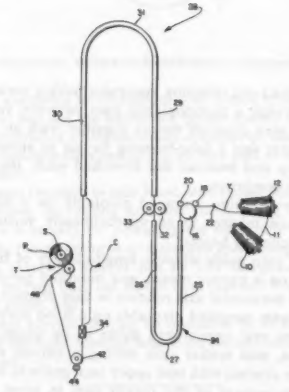


1. In a mower device,
a wheel-supported mower cowling having an open bottom,
a horizontal elongated cutting blade disposed within said cowling, said blade having sharpened cutting ends and an unsharpened center portion,
means operatively secured to said cowling for supporting and rotating said blade,
guard means secured to and covering the open bottom of said cowling, said guard means including a plurality of spaced apart elongated members extending longitudinally in the intended direction of travel of said mower device, the space between the forward ends of said elongated members and the forward end of said cowling being open and free from obstructions, the forward ends of said elongated members being disconnected with the spaces therebetween being free from obstructions, said elongated members having varying lengths to define an effective area substantially the same as the area defined by the unsharpened center portion of said blade when rotating so that the sharpened ends of said blade extend outwardly beyond the said effective area of said guard means.

3,971,200
PROCESS AND APPARATUS FOR CONTINUOUS HEAT SETTING OF CARPET YARNS

Hans Heinrich Richter, Warwick, R.I., assignor to Leesona Corporation, Warwick, R.I.

Continuation-in-part of Ser. No. 448,641, March 6, 1974, abandoned. This application Oct. 7, 1974, Ser. No. 512,181
Int. Cl.² D02G *1/04*; D01H *13/28*
U.S. Cl. 57—34 HS 15 Claims



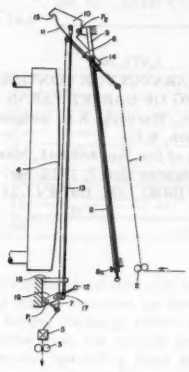
14. An apparatus for texturing yarn comprising first heating means for heating a moving strand of yarn to a temperature in the range of 160° to 200°C, second heating means downstream from said first heating means for heating said yarn during passage therethrough to a higher temperature than said first heating means, a cooling zone downstream from said second heating means, means for imparting a false twist to said moving yarn while said yarn is in said cooling zone and said second heating means, means for tensioning said moving yarn to a greater extent in said second heating means than in said first heating means, and means for collecting said moving yarn downstream from said false twisting means.

3,971,201

FALSE-TWIST CRIMPING MACHINE

Wolfgang Hartig, Remscheid, Germany, assignor to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany

Filed Aug. 7, 1975, Ser. No. 602,729
Claims priority, application Germany, Aug. 16, 1974, 2439183
Int. Cl.² D02G 1/02
U.S. Cl. 57—34 HS 6 Claims



1. In a false twist crimping apparatus having means to continuously stretch a thermoplastic yarn between yarn supply means and yarn draw-off means together with an elongated contact heater and a false-twisting device to simultaneously torque-crimp and heat-set the stretched yarn, the improvement which comprises:

a lower yarn guide arranged pivotably on a horizontally fixed axis relative to an approximately vertically positioned contact heater;

an upper yarn guide slidable longitudinally of the contact heater on a carrier means and mounted pivotably on a second horizontal axis relative to said contact heater;

a rocker cam mounted pivotably on a fixed horizontal axis adjacent said upper yarn guide in its upper operating position, said rocker cam having a curved surface for positive contact with said upper yarn guide to transfer the pivot movement of the rocker cam to pivot the upper yarn guide in applying yarn onto said heater or removing said yarn therefrom; and

linking means connecting the rocker cam and lower yarn guide to synchronize their pivot movements.

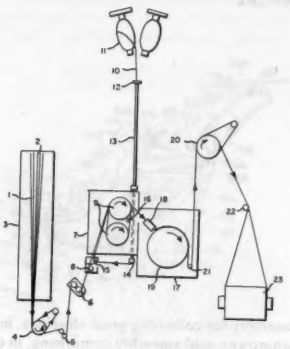
3,971,202

COBULKED CONTINUOUS FILAMENT YARNS

William Thomas Windley, Seaford, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 495,831, Aug. 8, 1974, abandoned. This application July 22, 1975, Ser. No. 597,980
Int. Cl.² D02G 3/12
U.S. Cl. 57—140 BY 19 Claims

1. A cobulked continuous filament yarn which comprises a first continuous filament yarn cobulked with a second continuous filament yarn in which the filaments of said cobulked yarn have random, three-dimensional curvilinear crimp with alternating regions of S and Z filament twist, the filaments of said second yarn are 4 to 20 percent longer than the filaments of said first yarn, and the filaments of said second yarn are frequently located near the surface of the cobulked yarn.

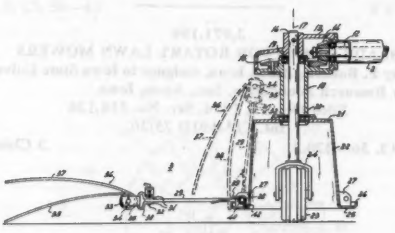


3,971,203

HAYMAKING MACHINES

Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Filed June 20, 1974, Ser. No. 481,311
Claims priority, application Switzerland, June 22, 1973, 8694/73
Int. Cl.² A01D 79/06
U.S. Cl. 56—370 27 Claims



1. A haymaking machine comprising a frame and at least one rake head rotatably mounted on said frame to turn about a substantially vertical axis, said rake head including at least one support arm pivoted on a pivotal axis to central housing means of said head, said pivotal axis being substantially inclined to said vertical axis of rotation, the outer end of said arm having a tine group that is freely pivotable about pivot means adjacaent said end, said arm being movable from a working position to a contracted transport position and a spring mechanism connected to bias said arm about said pivotal axis to the transport position during non-rotation of said head, driving means connected to said head to rotate same during operation.

3,971,204

CIRCUIT FOR DRIVING A DC MOTOR FOR A CLOCK

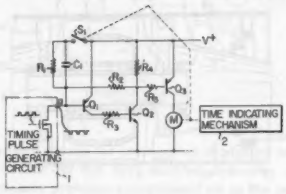
Norio Kawaguchi, No. 2-23-4-1202, Takashimadaira, Itabashi, Tokyo, and Toshio Yaehashi, No. 3-4-13, Minami, Ichikawa, Chiba, both of Japan

Filed Jan. 13, 1975, Ser. No. 540,650

Claims priority, application Japan, Jan. 17, 1974, 49-8487[U]

Int. Cl.² G04C 3/00; H02P 3/08

U.S. Cl. 58—23 D 5 Claims



1. A control circuit for a clock having a time indicating mechanism, which control circuit regulates the intermittent driving of a DC motor by a predetermined amount at predetermined time intervals so as to actuate said time indicating mechanism, said control circuit having a timing pulse generating circuit for generating timing pulses at said predetermined time intervals so as to actuate said control circuit and means for providing an energizing voltage for driving said motor, wherein the improvement comprises a holding circuit coupled at its input to said timing pulse generating circuit and at its output to said motor, said holding circuit being actuated to be self-held each time a timing pulse is applied thereto thereby enabling said motor to be driven by said energizing voltage, and switching means, coupled to said time indicating mechanism, so as to be actuated each time said motor is driven by said predetermined amount, said switching means being coupled to the input of said holding circuit so as to release the self-holding thereof when the switching means is actuated, whereby said motor is deenergized exactly at the completion of the driving thereof by said predetermined amount without being affected by the variation in the amplitude of said energizing voltage and the variation in the load on said motor.

3,971,205

ALL ELECTRONIC-TYPE TIMEPIECE

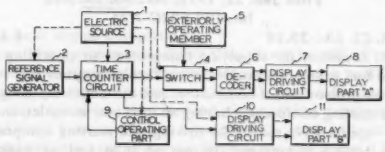
Yasushi Nomura, Tokorozawa, and Shigeru Morokawa, Higashiyamato, both of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Sept. 5, 1974, Ser. No. 503,458

Claims priority, application Japan, Sept. 6, 1973, 48-100696; Nov. 20, 1973, 48-130516

Int. Cl.² G04B 19/30, 19/24; G04C 3/00

U.S. Cl. 58—50 R 5 Claims



1. A time measuring device which is completely electronic comprising

a reference signal generating source for producing pulses,

a time counter cicuit for counting said pulses,

a decoder driving circuit for decoding the output of said time counter circuit,

a control operating member for initiating operation of said counter circuit,

a first electro-optical display part connected to said decoder for displaying measured time,

a switch controllable from said time counter circuit and independent of the operating condition of said first electro-optical display,

a second electro-optical display for displaying the operating condition of said time counter circuit, and

an additional electro-optical display circuit including a display driving circuit for driving said electro-optical display,

wherein when measuring time, operation of said switch causes at least a part of said first electro-optical display to extinguish and simultaneously causes said additional electro-optical display circuit to operate so that said second electro-optical display is driven and thereby indicates the operating condition of said time counter circuit.

3,971,206

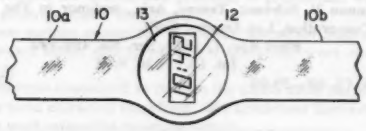
DISTRIBUTED WATCH

Raymond R. Martino, Sharon Hill, Pa., assignor to U.S. Electronic Services Corporation, Sharon Hill, Pa.

Filed Oct. 3, 1974, Ser. No. 511,593

Int. Cl.² G04B 37/00; G04C 3/00

U.S. Cl. 58—88 R 9 Claims



1. An electronic wristwatch-and-band arrangement comprising

a casing enclosing an electronic wrist watch movement and display, but not the electronic power source therefor,

a band formed of a longitudinally continuous, flexible member extending substantially from one end of the band to the other,

at least two recesses in said band, one recess being adapted to receive the casing and the other being adapted to receive a battery for powering the electronic watch,

the casing recess being so constructed and arranged that the casing inserted therein has its rim surrounded by the band, leaving only the watch face exposed from one side of the band, and

one of said recesses having an openable lid in the opposite side of the band through which the recess contents can be replaced.

3,971,207

PACKING MEANS FOR A WATCH

Tomomi Murakami, Higashi Yamato; Hiromichi Nagata, Higashi Murayama; Masakazu Funazawa, Tokorozawa, and Satoru Fukutome, Atsugi, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed May 19, 1975, Ser. No. 579,005

Claims priority, application Japan, May 21, 1974, 49-56860

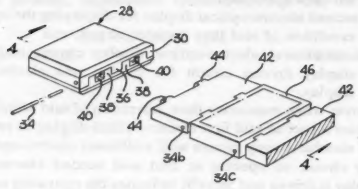
Int. Cl.² G04B 23/12, 37/08; G04C 23/04

U.S. Cl. 58—152 B 19 Claims

1. A packing means disposed in a watch for allowing an electrical connection to be made between said watch and an external device and for providing a substantially watertight seal in said watch, said packing means comprising:

a first ring member made of a resilient, non-conductive flexible material, said ring member disposed in said watch so as to provide a substantially watertight seal therein; and

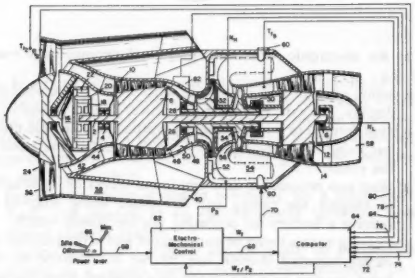
at least one arm member made of a resilient, conductive flexible material having first and second ends, said first end coupled to said ring member within said watch, and said second end extending outwardly therefrom and coupled to electrically said device so as to electrically couple said watch with said external device, said arm member coupled to said ring member such that said substantially watertight seal in said watch case is not destroyed.



3,971,208
GAS TURBINE FUEL CONTROL

Glennon V. Schwent, Tempe, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Apr. 1, 1974, Ser. No. 456,492
Int. Cl.² F02C 9/02
U.S. Cl. 60—39.03 **12 Claims**



11. A method of controlling fuel flow to a gas turbine engine, said engine having at least one compressor-turbine spool and a compressor bleed surge valve, said method comprising:

generating a fuel flow power signal indicative of desired engine output;

generating a first plurality of fuel schedule signals including an engine surge schedule signal, said schedule signals being derived from engine operation limits;

selecting the lowest of said power signal or said first fuel schedule signals;

generating a second plurality of fuel schedule signals derived from engine operating limits;

selecting the highest schedule signal of said second schedule signals or first selector signal;

comparing said selected highest signal and said surge schedule signal;

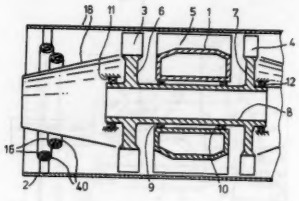
opening said surge valve to increase compressor bleed if the surge schedule signal is limiting said selected highest signal wherein opening said surge valve raises the surge schedule limit; and

increasing said selected highest fuel signal to the level permitted by the increased surge schedule.

3,971,209
GAS GENERATORS

Rory Somerset de Chair, St. Osyth's Priory, St. Osyth, Essex, England

Continuation-in-part of Ser. No. 327,180, Jan. 21, 1973, abandoned. This application July 16, 1974, Ser. No. 489,063
Claims priority, application United Kingdom, Feb. 9, 1972, 6158/72
Int. Cl.² F02C 3/16, 3/14
U.S. Cl. 60—39.14 **25 Claims**



1. In a gas generator including housing means having an air inlet and an exhaust gas outlet, bearing means mounted inwardly of said housing means, a rambine rotor; said rambine rotor being rotatably mounted on said bearing means and having a plurality of blades, each of said blades and a next adjacent one of said blades defining an inlet passage for compressing air induced from said air inlet, there being an axially extending region downstream of said inlet passages, and means for dispensing fuel into said axially extending region for combustion with air received from said inlet passages, said rambine rotor having means defining outlet passages for expanding the products of combustion; and wherein there is further provided:

a. a plurality of compressor rotors upstream of the inlet side of said rambine rotor, each compressor rotor having at least one set of radial blades, said blades being shaped so as to impart a component of velocity to an exit gas stream from the compressor rotor in the direction of rotation of said compressor rotors, that compressor rotor adjacent the rambine rotor being in direct communication therewith,

b. bearing means for rotatably supporting said compressor rotors, and

c. means for rotating successive compressor rotors at successively faster rotational speeds in a like direction and in the opposite direction to the direction of rotation of the rambine rotor.

3,971,210
START-UP COMPRESSED AIR SYSTEM FOR GAS TURBINE ENGINES

Willis Earl Rose, Connersville, Ind., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jan. 22, 1975, Ser. No. 543,092
Int. Cl.² F02C 7/26
U.S. Cl. 60—39.14 **6 Claims**

1. A system for supplying compressed air providing atomized fuel to the fuel nozzles in gas turbine engines that include a compressor and a combustor, said system comprising:

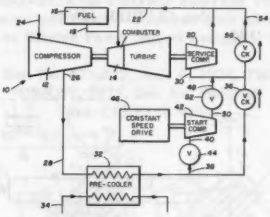
a starting compressor having an inlet and an outlet; constant speed drive means for driving said starting compressor;

a service compressor having an inlet and an outlet and arranged to be driven by said engine;

first conduit means connecting the outlet of said starting compressor in fluid communication with the inlet of said service compressor;

second conduit means connecting the inlet of said starting compressor in fluid communication with said first conduit means and with the gas turbine compressor;

one-way valve means located in said second conduit means permitting flow through said second conduit means from the inlet of said starting compressor and from the turbine compressor to said first conduit means and preventing flow in the opposite direction; and,

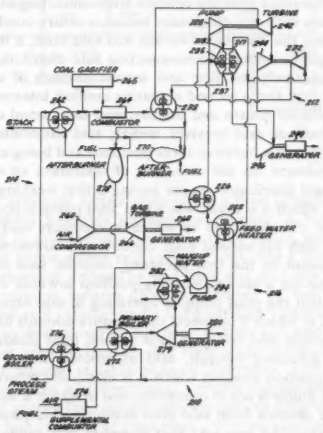


third conduit means for connecting the outlet of said service compressor to the fuel nozzles, whereby said starting compressor provides compressed air to the nozzles during start-up and augments said service compressor until said service compressor reaches operating speed.

3,971,211
THERMODYNAMIC CYCLES WITH SUPERCRITICAL CO_2 CYCLE TOPPING

Jay D. Wethe, Whittier, and William M. Waters, Glendora, both of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Apr. 2, 1974, Ser. No. 457,286
Int. Cl.² F01K *23/04*
U.S. Cl. 60—39.18 R **3 Claims**



1. A heat engine comprising:

a circulating system containing CO_2 above its critical pressure, a CO_2 pump having an inlet and an outlet, said CO_2 pump raising the pressure of the CO_2 from a first supercritical pressure to a second supercritical pressure, a primary heat exchanger having a CO_2 inlet and outlet, said primary heat exchanger heating the CO_2 when it is at a pressure above said first supercritical pressure, a secondary heat exchanger having a CO_2 inlet and outlet, said secondary heat exchanger cooling the CO_2 when it is at said first supercritical pressure, a recuperator having high and low pressure sides, said recuperator being for transferring heat from the CO_2 at the first pressure to CO_2 at a higher supercritical pressure, and a turbine having an inlet and an outlet, said turbine expanding the CO_2 extracting work therefrom and exhausting at said first supercritical pressure; and

a gas turbine system having a compressor for increasing the pressure of air fed thereto, a combustor having an input to receive the compressed air from the compressor and an input to receive fuel, the compressed air and fuel being burned in said combustor to form hot combustion products, means for placing said hot combustion products in heat transfer relationship with the CO_2 in said primary heat exchanger to heat the CO_2, and a turbine connected to receive the combustion products from said primary heat exchanger, said turbine expanding and cooling said combustion products to extract work therefrom to drive said compressor, said CO_2 turbine being connected at its high pressure side to said primary heat exchanger and on its low pressure side to said recuperator, said recuperator being connected to pass a portion of the low pressure CO_2 to said secondary heat exchanger, said secondary heat exchanger cooling the CO_2 and conducting it to said CO_2 pump which pressurizes said CO_2 and conducts it to the high pressure side of said recuperator, said system including a CO_2 compressor connected to receive a portion of the low pressure CO_2 from said recuperator and to pressurize it; said recuperator high pressure side including a junction for receipt of the CO_2 pressurized by said CO_2 compressor, the heat engine further including:

a primary boiler connected to receive the combustion products from said turbine, said primary boiler transferring heat from the combustion products to pressurized water to generate steam therefrom;

a steam turbine connected to receive the steam from said primary boiler and to expand it to extract work therefrom;

a condenser connected to receive the steam once the work has been extracted therefrom, said condenser converting the work extracted steam to water;

a water pump connected to said condenser to pressurize the water therefrom;

feed water heater means connected to said water pump and being in heat transfer relationship to said secondary heat exchanger which extracts heat from the CO_2 by heating the pressurized water; and means for conducting the pressurized water from said feed water heater means to said primary boiler for heating into steam.

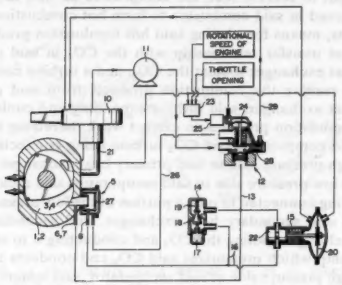
3,971,212
METHOD OF AND AN APPARATUS FOR PURIFYING EXHAUST GASES OF AN INTERNAL COMBUSTION ENGINE

Minoru Morita, Nagoya, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 20, 1974, Ser. No. 471,829
Claims priority, application Japan, Feb. 7, 1974, 49-15763
Int. Cl.² F02B *75/10;* **F01N** *3/10*
U.S. Cl. 60—290 **3 Claims**

1. A system for purifying exhaust gases of an internal combustion engine by a manifold reactor with the injection of secondary air into the exhaust gases which comprises, providing a source of the secondary air, a first secondary air supply port which opens into the exhaust gas passage extending from an exhaust port of the engine to the manifold reactor, a second secondary air supply port which opens into the inside space of the manifold reactor, conduit means for transmitting secondary air from said source to said first and second secondary air supply ports, said conduit means including a main passage which leads to said first secondary air supply port and a branch passage which is branched from said main passage and leads to said second secondary air supply port, said branch passage including automatic control valve means for altering the ratio of the flow of air through said branch passage with respect to the total secondary air flow, according to at least one operating condition of the engine including the tempera-

ture thereof, said automatic control valve comprising a thermostat valve which is open when the temperature of the engine is low and is gradually closed as the temperature of the engine rises.



3,971,213

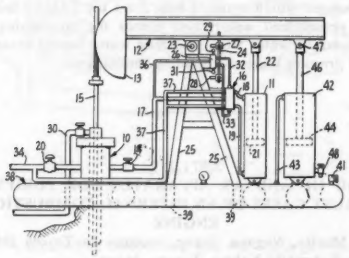
PNEUMATIC BEAM PUMPING UNIT

Robert K. Kelley, 3944 Floyd Drive, Fort Worth, Tex. 76116

Continuation-in-part of Ser. No. 355,577, April 30, 1973, abandoned. This application Nov. 4, 1974, Ser. No. 520,430

Int. Cl.² F15B *21/06*

U.S. Cl. 60—372 25 Claims



1. Apparatus for pumping liquids from gas producing wells, comprising

a well pumping unit having a reciprocably tilting walking beam,

a pneumatic cylinder having a piston connected to said walking beam,

valve means adapted for connection to the well casing head for receiving gas under pressure therefrom and for connection to a gas sales line,

and conduits connecting said valve means to the opposite ends of said cylinder,

said valve means being formed for selectively supplying gas under pressure to an end of said cylinder and for connecting the other end of said cylinder to the sales line whereby movement of said piston toward said other end of said cylinder forces gas therefrom and into said sales line,

said valve means being responsive to tilting movement of said walking beam to alternate the cylinder ends to which gas under pressure is supplied.

3,971,214

ASSISTED HYDRAULIC CONTROL

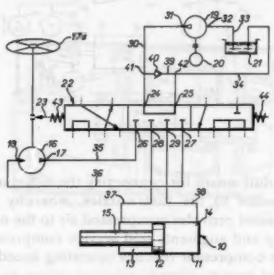
Bernard Mercier, 8 Chemin Jean Jullien, Ville d'Avray (Hauts de Seine), France

Filed Mar. 19, 1975, Ser. No. 559,836

Claims priority, application France, Mar. 29, 1974, 74.11178

Int. Cl.² F15B *15/18*

U.S. Cl. 60—386 7 Claims



1. An assisted hydraulic control comprising a double acting receiver means having a cylinder in which a piston defines first and second opposite chambers, a bidirectional volumetric pilot pump having a first and a second orifice and working either in a first direction in which it sucks in fluid through the second orifice and delivers said fluid through the first orifice, or in a second direction in which it sucks in fluid through said first orifice and delivers it through the second orifice, a hydraulic station having a source of pressure and a tank, a distributor means, a pressure conduit interconnecting said source of pressure with said distributor means, a return conduit interconnecting the distributor means and said tank, a first and a second pilot conduit interconnecting said distributor means and respectively the first and second orifices of said pilot pump, a first and a second actuating conduit interconnecting the distributor means and the first and the second chambers respectively of said receiver means, said distributor means being switchable between three positions and being controlled in dependence on the direction of operation of said pilot pump, said distributor means having a first working position towards which it is urged when said pilot pump is operating in said first direction and in which it connects said pressure conduit with the second pilot conduit and connects the first pilot conduit to the first actuating conduit, said distributor means having a second working position towards which it is urged when the pilot pump is operating in said second direction and in which it connects the pressure conduit to said first pilot conduit and connects said second pilot conduit to the second actuating conduit, said distributor means having a neutral position towards which it is elastically returned when the pilot pump is not in operation, and in which it isolates said pressure conduit from said pilot conduits, said piston having a rod extending into said first chamber and giving said first chamber a section smaller than that of said second chamber, said distributor means connecting, in the first working position, said return conduit to the second actuating conduit; said hydraulic control having one single said distributor means further comprising a fixed body having six orifices, namely: a pressure orifice coupled to the pressure conduit of said hydraulic station, a return orifice coupled to said return conduit, a first pilot orifice coupled to said first pilot conduit, a second pilot orifice coupled to said second pilot conduit, a first actuating orifice coupled to said first actuating conduit and a second actuating orifice coupled to said second actuating conduit, said distributor means further comprising at least one moving portion arranged inside said fixed body in such manner that, in said second working position, the pressure orifice

is coupled to said first pilot orifice, the return orifice is closed, and said second pilot orifice and the two actuating orifices are all three coupled together.

3,971,215

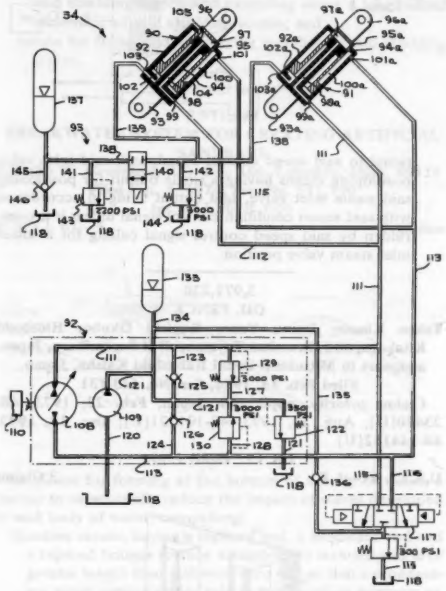
POWER SHOVEL AND CROWD SYSTEM THEREFOR

George B. Baron, and Paul W. Padrutt, both of Marion, Ohio, assignors to Marion Power Shovel Company, Inc., Marion, Ohio

Division of Ser. No. 477,022, June 6, 1974. This application Jan. 31, 1975, Ser. No. 545,885

Int. Cl.[2] F15B *1/02*

U.S. Cl. 60—403 6 Claims



1. An actuating system comprising a fluid actuated, piston and cylinder assembly including a cylinder, a fixed piston mounted in said cylinder and a movable piston mounted on said fixed piston within said cylinder providing a first variable volume chamber defined by said fixed and movable pistons, a second variable volume chamber defined by said movable piston and said cylinder and a third variable volume chamber defined by said movable and fixed pistons and said cylinder; means for selectively supplying fluid under pressure to said first and second variable volume chambers, said selective means including a bi-directional, variable displacement pump and fluid supply lines operatively interconnecting said pump and said first and second chambers; a first accumulator constituting an energy storage means; a closed hydraulic circuit intercommunicating said third chamber and said accumulator, said closed hydraulic circuit including a cutoff valve disposed between said third chamber and said energy storing means; a first relief valve connected to said closed hydraulic circuit between said third chamber and said cutoff valve, adapted to open responsive to a predetermined pressure in said closed hydraulic circuit between said third chamber and said cutoff valve when said cutoff valve is closed; and a second relief valve connected to said closed hydraulic circuit between said energy storing means and said cutoff valve, adapted to open responsive to a predetermined pressure in said closed hydraulic circuit between said energy storing means and said cutoff valve when said cutoff valve is closed.

3,971,216

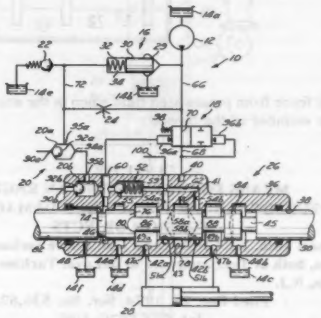
LOAD RESPONSIVE SYSTEM WITH SYNTHETIC SIGNAL

Wendell E. Miller, Warsaw, Ind., assignor to The Scott & Fetzer Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 480,756, June 19, 1974, abandoned. This application June 25, 1975, Ser. No. 590,103

Int. Cl.[2] F16H *39/46*; F15B *11/16*

U.S. Cl. 60—445 78 Claims



52. A directional control valve of the type which includes a body having an inlet port means (**340***a*) and a work port (**342***a*), return port means (**344***a*) in said body, and a movable valving element selectively communicating said work port with said inlet port means and with said return port means, the improvement which comprises:

a. a signal control port (**360**) in said body communicating with said valving element;

b. means (**186***a* + **190***a*) for establishing a first fluid flow path from said signal control port to said work port when said valving element communicates said inlet port means to said work port, and for selectively establishing a second fluid flow path from said signal control port to said return port means; and

c. means (valved signal supply restrictor **198***a*) for establishing a restricted flow path from said inlet port means to said signal control port when said valving element communicates said inlet port means to said work port.

3,971,217

RECIPROCATABLE DEVICES

Donald Firth, Glasgow, Scotland; Keith Foster, and Christopher John Hooke, both of Birmingham, England, assignors to The Secretary of State for Trade and Industry in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Division of Ser. No. 299,178, Oct. 19, 1972, abandoned. This application Oct. 3, 1974, Ser. No. 511,523

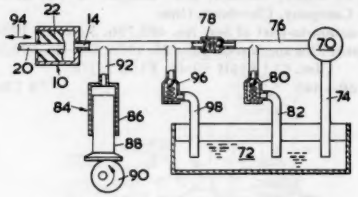
Claims priority, application United Kingdom, Aug. 4, 1972, 36447/72

Int. Cl.[2] F15B *13/09*, *15/04*

U.S. Cl. 60—486 8 Claims

1. A hydraulic system having a reciprocatable device comprising an outer member, an inner member which can be reciprocated relative to the outer member in a given axial direction, and a resilient member connecting said outer and inner members so as to form a seal therebetween, an end of the outer member forming an enclosure which can contain pressurized fluid through which force can be applied to the inner member to move said inner member in said axial direction relative to the outer member while flexing the resilient member, the average thickness of the resilient member in a direction normal to the axial direction being not greater than the average length of said resilient member in said axial direc-

tion and a piston which is a close sliding fit in the end of the said outer member, said piston being arranged so that it can



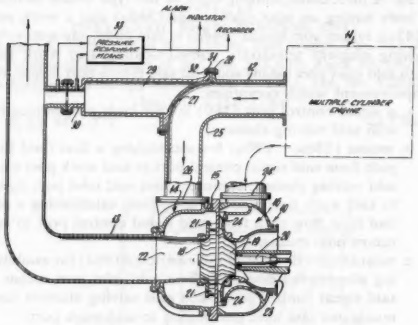
apply force from pressurized fluid when in the enclosure to the inner member of the device.

3,971,218

MEANS FOR PREVENTING AN ENGINE TURBOCHARGER FROM BEING DAMAGED BY FOREIGN OBJECTS

Michael Toth, Jr., Crosby, and Jean Andre Jackson, Jr., Houston, both of Tex., assignors to DeLaval Turbine Inc., Princeton, N.J.

Filed Dec. 26, 1974, Ser. No. 536,625
Int. Cl.[2] F02G *3/00*
U.S. Cl. 60—597 **13 Claims**



7. The combination of claim 1, and including an internal-combustion engine having an exhaust connection to said inlet duct for rotor operation by engine-exhaust gases, and air-compressor means driven by said rotor for compression of inlet air supplied to said engine.

3,971,219

TURBINE CONTROL SYSTEM

Franklyn H. Taylor, Leominster, and Edward J. Finck, Townsend, both of Mass., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 22, 1975, Ser. No. 606,839
Int. Cl.[2] F01D *17/02*; **F01K** *13/02*
U.S. Cl. 60—660 **7 Claims**

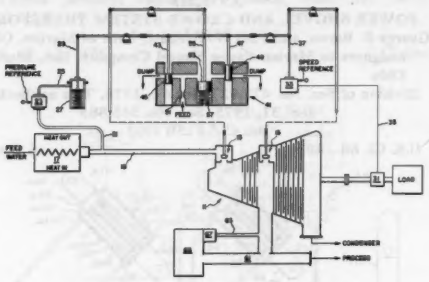
1. A control system for an extraction steam turbine of the type having a steam inlet valve and an extraction control valve, said steam turbine being driven by steam from a steam generator in fluid communication with said steam inlet valve through a steam inlet conduit, said control system comprising:

means for sensing a steam inlet condition and for comparing said steam inlet condition with a reference steam condition to derive a steam condition control signal;

means for sensing turbine speed and for comparing said turbine speed with a reference speed to derive a speed control signal;

means for positioning said extraction control valve in response to said speed control signal; and,

means for positioning said steam inlet valve, said inlet valve positioning means having a first input proportional to said steam condition control signal and a second input proportional to said speed control signal; and, said inlet valve positioning means having a single output for positioning said steam inlet valve, said output being in accordance with said steam condition control signal unless it is overridden by said speed control signal calling for a lower inlet steam valve position.

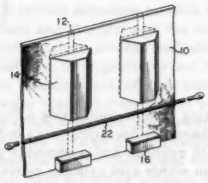


3,971,220

OIL FENCE

Takeo Kinase; Isamu Yano; Kanichi Okubo; Hidetoshi Kitakoga, and Hiromitsu Tayama, all of Sagamihara, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Feb. 15, 1974, Ser. No. 443,131
Claims priority, application Japan, Feb. 23, 1973, 48-23420[U]; Aug. 30, 1973, 48-101721[U]; Dec. 12, 1973, 48-144152[U]
Int. Cl.[2] E02B *15/04*
U.S. Cl. 61—1 F **3 Claims**



1. An oil fence comprising, in combination:

an elongated water impervious sheet-like flexible shielding screen having a pair of opposed longitudinal edges and a pair of opposed major surfaces;

a plurality of rigid reinforcing strips disposed at intervals along the longitudinal dimension of said shielding screen and extending in a transverse dimension of said shielding screen;

means for fixing said rigid reinforcing strips to said shielding screen;

a plurality of pairs of opposed rigid elongated floats, each pair of opposed floats comprising a first float adjacent one of said opposed major surfaces and a second float adjacent the other of said opposed major surfaces and opposite said first float, each of said pairs of opposed floats being disposed along the longitudinal dimension of said shielding screen and extending in the transverse dimension thereof and spaced from other pairs of said opposed floats to permit flexing of the shielding screen at the spaces between pairs of said opposed floats, said pairs of opposed floats being disposed in groups about respective ones of said reinforcing strips and wherein the re-

spective groups of floats are spaced apart along the longitudinal dimension of said shielding screen;

means for fixing said pairs of opposed floats to said shielding screen comprising a plurality of sheet-like members each overlying a respective one of said groups of floats and each adhered to said shielding screen at the border of the respective one of said groups and at the spaces defined between adjacent ones of the pairs of said opposed floats comprising the respective one of said groups to maintain said groups of floats adjacent to said shielding screen;

means disposed along a longitudinal edge portion of said shielding screen for weighting said edge portion to eliminate the buoyancy thereof;

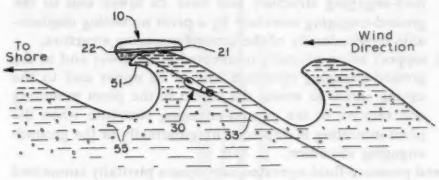
a rope-like reinforcing member disposed on a surface of said shielding screen and extending along a longitudinal dimension of said shielding screen; and

means for fixing said reinforcing member to said shielding screen.

3,971,221
BREAKWATER SYSTEM FOR CREATING ARTIFICIAL SANDBARS

Charles W. Greenleaf, P.O. Box 156, Lakeside, Mich. 49116

Filed Oct. 4, 1974, Ser. No. 511,990
Int. Cl.² E02B 3/06
U.S. Cl. 61—5 **7 Claims**



1. Means for forming at the bottom of a body of water, a barrier to substantially reduce the impact of waves developed in said body of water, comprising:

flotation means, having a leeward end, a windward end and a tapered bottom surface whereby said leeward end is of greater length than said windward end so that a propagating wave passing under said bottom surface contacts an increasingly greater area thereof, thereby applying a proportionately greater upward force to said flotation means at said leeward end than at said windward end; said flotation means being adapted to have a first position wherein said leeward end intersects the plane of the surface of said body of water, and a second position wherein said flotation means floats upon the surface of said body of water;

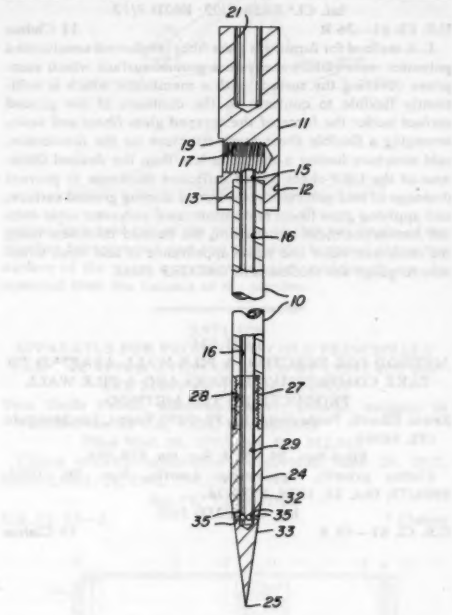
means, defining a pivotal axis for said flotation means extending substantially parallel to said leeward end and being closer thereto than said windward end, for permitting said flotation means to be alternatively moved into said first position and said second position; and

structural means for applying a predetermined force to said flotation means causing said flotation means to pivot about said axis and urge said leeward end into said body of water so that said flotation means are normally in said first position; said leeward end, when urged into said body of water, causing particulate material suspended therein to gravitate to the bottom to form a barrier for said waves; said predetermined force applied by said structural means being adapted to be overcome when waves of a predetermined size are developed in said body of water and applied to said bottom surface of said flotation means, whereupon said flotation means are temporarily pivoted about said axis to said second position to prevent damage to said flotation means and said structural means when waves of said predetermined size are developed.

3,971,222
SOIL STABILIZATION

Robert E. Griffith, Jr., Houston, Tex., assignor to Robert Burke, Robstown, Tex., a part interest

Filed May 28, 1974, Ser. No. 473,892
Int. Cl.² E02D 3/12
U.S. Cl. 61—36 R **4 Claims**



1. Apparatus for use in delivering fluid stabilizing material to subsurface soil under pressure with minimal return to surface of the fluid stabilizing material along the path of the apparatus, comprising elongate conduit means of uniform outer diameter throughout its length without any inward depressions or outward projections along its length whereby it may be driven longitudinally into the ground without disturbing the walls of its penetration path, head means at the upper end of said conduit means having a fluid flow inlet communicating with the interior of said conduit means, said inlet having connection means for connection of said inlet to a separate conduit, tip means at the lower end of said conduit means having a cylindrical upper portion of the same outer diameter as said conduit means and a downwardly diminishing conical portion therebelow terminating downwardly in a pointed tip, the exterior of said lower end of said conduit means at the junction therebetween and said tip means having smoothly reduced to said pointed tip, said tip means having passage means extending longitudinally therethrough downwardly from said junction terminating above said pointed tip and having at least one laterally disposed fluid outlet port extending from the lower end of said passage to exit at a reduced portion of said tip means, whereby when said tip means and conduit means are driven into the ground the soil through which the same are driven is compressed outwardly by downward movement of the reduced portions of said tip means to form an uninterrupted annular ring of compressed soil around said upper portion of tip means and around said conduit means above said outlet ports and thereby forming a seal around said apparatus to prevent flow of fluid stabilizing material injected from said outlet ports into the soil upwardly around said.

3,971,223
PROTECTION METHOD

Joseph Edward Barrett, Twickenham, England, assignor to The British Petroleum Company Limited, London, England

Filed Dec. 4, 1974, Ser. No. 529,270
Claims priority, application United Kingdom, Dec. 12, 1973, 57472/73; Mar. 19, 1974, 12049/74
Int. Cl.² E02B 5/02; E02D 3/12
U.S. Cl. 61—36 R 11 Claims

1. A method for forming a glass fiber reinforced unsaturated polyester resin (GRP) sheet on a ground surface which comprises covering the surface with a membrane which is sufficiently flexible to conform to the contours of the ground surface under the force of the sprayed glass fibers and resin, arranging a flexible sheet mesh structure on the membrane, said structure having a thickness less than the desired thickness of the GRP sheet but of sufficient thickness to prevent drainage of said polyester resin from a sloping ground surface, and applying glass fibers and unsaturated polyester resin onto the membrane/mesh structure to the desired thickness using the thickness, color and visual appearance of said mesh structure to gauge the thickness of said GRP sheet.

3,971,224
METHOD FOR ERECTING A PILE WALL ADAPTED TO TAKE COMPRESSIVE FORCES AND A PILE WALL PRODUCED BY THE METHOD

Erwin Elkuch, Toniaulestr. 10, FL-9490 Vaduz, Liechtenstein (FL 9490)

Filed Nov. 20, 1974, Ser. No. 525,295
Claims priority, application Austria, Nov. 26, 1973, 9906/73; Oct. 15, 1974, 8282/74
Int. Cl.² E21D 5/00
U.S. Cl. 61—41 A 19 Claims

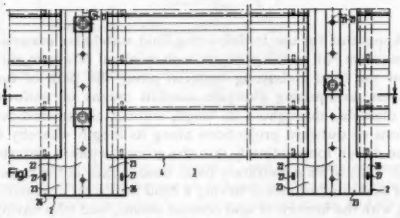


Fig1

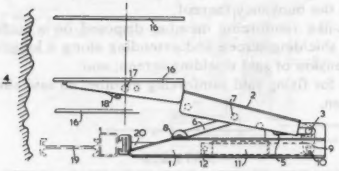
1. A method of erecting a retaining wall which is adapted to resist pressure exerted by a medium behind said retaining wall, said method comprising the steps of:

positioning a plurality of piles vertically at intervals in a substrate, inserting a plurality of suspension means in the form of hooks in apertures along the vertical side edges of said verticle piles, and closing the free zones between said vertical piles from the insides of said vertical piles remote from the medium by hanging a plurality of interconnecting bridging piles from said suspension hooks, the upper and lower edges of each bridging pile being engageable with adjacent suspension hooks on adjacent vertical piles so that said plurality of bridging piles are disposed generally perpendicular to the vertical piles, and whereby said suspension hooks lock said bridging piles to said vertical piles.

3,971,225
MINE SUPPORT ASSEMBLIES

Wilhelm Wertelewski, and Jorg Schade, both of Datteln, Germany, assignors to Becorit Grubenausbau GmbH, Recklinghausen, Germany

Filed Feb. 28, 1975, Ser. No. 554,025
Claims priority, application Germany, Apr. 8, 1974, 2417048
Int. Cl.² E21D 15/44
U.S. Cl. 61—45 D 8 Claims



1. A shield support assembly for underground mining operations, said assembly comprising:

a ground-engaging structure;

a roof-engaging structure;

a caving shield pivotally connected near its upper end to the roof-engaging structure and near its lower end to the ground-engaging structure by a pivot mounting displaceable longitudinally of the ground-engaging structure;

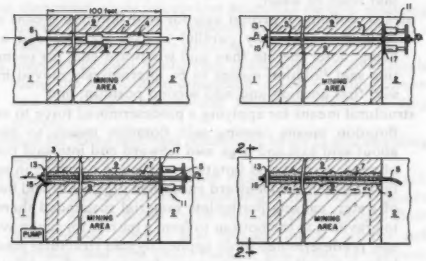
a support beam pivotally connected at its lower end to the ground-engaging structure and at its upper end to the caving shield to rotate the shield in the pivot mounting and relative to the ground-engaging structure when the pivot mounting is displaced longitudinally of the ground-engaging structure;

and pressure-fluid-operated ram means pivotally connected between the ground-engaging structure and the caving shield to displace the pivot mounting longitudinally of the ground-engaging structure so as to move the support beam to rotate the shield and raise and lower the roof-engaging structure.

3,971,226
PRESTRESSED ROOF SUPPORT SYSTEM

Roger J. Morrell, Bloomington, Minn., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Oct. 31, 1975, Ser. No. 627,650
Int. Cl.² E21D 21/00
U.S. Cl. 61—45 B 5 Claims



1. A method for supporting a mine roof between two mine cavities comprising the steps of:

drilling a series of generally horizontal holes above the area to be worked, each of said drilled holes extending from one mine cavity to a distant mine cavity;

inserting an elongated support member into each of said holes such that it extends lengthwise from one of said cavities to the other cavity;

pretensioning of said support members while fully inserted in the holes and extending between said two cavities by first firmly anchoring one end of said member near one hole cavity;

forcing a liquid filler bonding agent between each of the walls of said holes and said support while inserted in its hole; and

releasing said pretension applied to said support member after said bonding agent sets to bond the support member to the wall of its hole.

3,971,227
INSTALLATION OF EXPANDED BASE PILES

Augustus P. Godley, Sugar Land, Tex., assignor to Raymond International Inc., Houston, Tex.

Filed Feb. 19, 1974, Ser. No. 443,222
Int. Cl.² E02D *5/30, 5/48*
U.S. Cl. 61—53 **22 Claims**

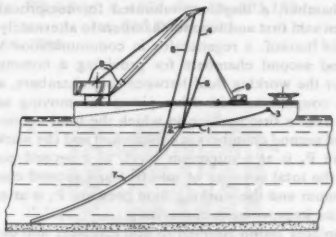
1. A foundation pile construction comprising a massive precast pile tip driven into the earth, a tubular sleeve extending part way into the material of said tip, said sleeve extending out from said tip, and an elongated tubular stem casing fixedly attached to said tubular sleeve by a ring having an internal shoulder for receiving hammer blows, said tubular stem casing extending therefrom, up to the surface of the earth and being of substantially thinner wall thickness than that of said sleeve.

3,971,228
PROCESS AND SYSTEM FOR LIFTING SUBMARINE PIPELINES

Antonio Silvestri, and Pasquale Brando, both of San Donato Milanese, Italy, assignors to Saipem S.p.A., San Donato Milanese, Italy

Filed Feb. 22, 1974, Ser. No. 444,772
Claims priority, application Italy, Feb. 23, 1973, 20745/73
Int. Cl.² F16L *1/00*
U.S. Cl. 61—114 **1 Claim**

1. A method of lifting a closed end of a pipeline submerged in water from a deep depth to the surface of the water and recovering a length of said pipeline terminating in said end, which consists in first exerting a diagonal pull on said end by means of a capstan mounted on a floating pontoon and having an adjustable tension, and then simultaneously exerting a lift on said pipeline at said end and at least one point spaced from said end by means of a set of cranes mounted on said pontoon, at least one of said cranes being mounted for movement on said pontoon and adapted to exert a lift at said end of the pipeline, and at least one other crane being fixed to said pontoon and adapted to exert a lift at said end and at the point

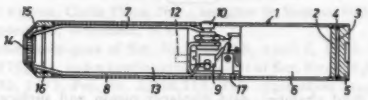


spaced from said end of the pipeline so that the length of the pipeline between said end and said point is raised above the surface of the water to a point at which said length may be removed from the balance of the pipeline.

3,971,229
APPARATUS FOR PRODUCING COLD PRINCIPALLY FOR THE APPLICATION OF COLD BY CONTACT ON THE BODY OF LIVING BEINGS

Yves Emile Privas, Killowen-Blarney, Ireland, assignor to Panoduz-Anstalt Co., Vaduz, Liechtenstein

Filed Mar. 20, 1973, Ser. No. 342,962
Claims priority, application Switzerland, Mar. 29, 1972, 554,683, Nov. 22, 1972, 574,259
Int. Cl.² F25B *21/02*
U.S. Cl. 62—3 **7 Claims**



1. An apparatus for generating cold, principally for the application of cold by contact on the body of living beings, constituted by a very small, light apparatus which is easy to take hold of and easy to handle in one hand, comprising a body carrying a very small generator rapidly generating cold within the temperature range of −10°C to −80°C, the surface of application of cold by contact being constituted by the actual surface of the generating element or by an auxiliary surface which is thermally connected to the latter, the cold generating element comprising at least one thermoelement having a Peltier effect and the apparatus also carries means for cooling the hot face of the thermoelement and means for supplying electric current to the generating element including means for connecting and disconnecting said supply of current said apparatus further including a device which acts as a support for the apparatus and which ensures the recharging of the battery through a circuit which is closed by the mere fact that the apparatus is mounted on the support.

3,971,230
STIRLING CYCLE ENGINE AND REFRIGERATION SYSTEMS

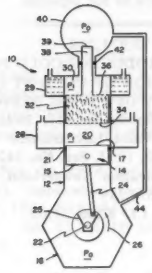
James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Walter H. Higa, Tujunga, Calif.

Filed May 5, 1975, Ser. No. 574,208
Int. Cl.² F25B *9/00*
U.S. Cl. 62—6 **12 Claims**

1. In a Stirling cycle engine of the type including first and second variable volume chambers, a working fluid, heating

means for supplying heat at a temperature T_h to working fluid in said first chamber, cooling means for absorbing heat at a temperature T_c from working fluid in said second chamber, $T_h >> T_c$, the working fluid being at a variable pressure definable as P_1, a drive piston having a top surface exposed to said first chamber, a displacer mounted for reciprocal motion between said first and second chambers to alternately vary the volumes thereof, a regenerator in communication with said first and second chambers for providing a communication path for the working fluid between said chambers, and drive means coupled to said drive piston for moving said drive piston from a first position in which the total volume of said first and second chambers is a maximum and the working fluid pressure P_1 is at a minimum level, to a second position in which the total volumes of said first and second chambers is a minimum and the working fluid pressure P_1 is at maximum level, the improvement comprising:

a displacer piston coupled to said displacer and defining an end surface remote therefrom;



a third chamber, said displacer piston end surface being disposed therein, and the pressure in said third chamber being substantially constant and definable as P_o, P_o being between the maximum and minimum levels of P_1, whereby as said drive piston moves from said first position toward said second position, when P_1 is greater than P_o said displacer moves in a direction to minimize the volume of said second chamber and thereby force working fluid contained therein to pass through said regenerator to said first chamber, and drive piston being movable by said drive means and working fluid present in said first chamber and heated by said heating means, from said second position to said first position, whereby as said working fluid pressure P_1 drops below P_o, and displacer moves in a direction to decrease the volume of said first chamber and increase the volume of said second chamber.

3,971,231

REFRIGERATOR WITH DRY ICE COOLANT

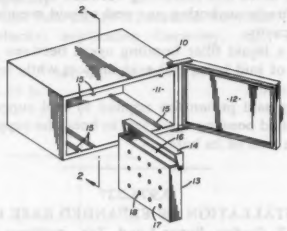
Juanita Derry, 2009 W. Washington St., Ext., New Castle, Pa. 16101

Filed Mar. 27, 1974, Ser. No. 455,515

Int. Cl.[2] F25D *3/12*

U.S. Cl. 62—388 **5 Claims**

1. A refrigerator consisting of an insulated cabinet having an access opening and a hinged insulated closure therefor and at least one hollow partition forming a receptacle, dry ice positioned in said receptacle, said hollow partition being positioned in said insulated cabinet and being of a size dividing the interior of said insulated cabinet into two separate areas, said hollow partition having a perforated side and an unperforated side and located in said insulated cabinet so that the perforated side communicates with one of said separate areas to



form a freezer and the unperforated side communicates with the other of said separate areas to form a refrigerator.

3,971,232

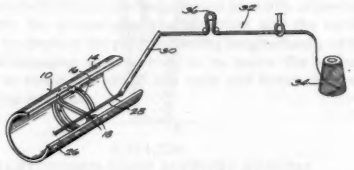
ROTARY KNITTING MACHINE

Phillip H. Darling, c/o Bentley Labs., Inc., 17502 Armstrong, Irvine, Calif. 92705

Continuation-in-part of Ser. No. 273,819, July 21, 1972, abandoned. This application Aug. 27, 1973, Ser. No. 392,069

Int. Cl.[2] D04B *23/04*; **D05B** *57/04*, *57/30*

U.S. Cl. 66—1 R **11 Claims**



1. A knitting device including

at least one rotary needle including an outermost peripheral edge and at least two circumferentially spaced openings extending radially inwardly from said outermost peripheral edge, said openings defining loop forming means for releasably capturing and pulling a segment of filament into a loop as said rotary needle is rotated about an axis extending through its center of rotation;

drive means for rotating said needle about said axis, said drive means operatively engaging only said outermost peripheral edge throughout the entire rotational cycle of said needle such that the internal portion of said needle on which said loop is carried remains completely unencumbered throughout the entire rotational cycle of said needle, said drive means supporting said needle so that said center of rotation is not at any time radially displaced from said axis during rotation of said needle; and

means for feeding filament to the vicinity of said rotary needle so that, during a rotational cycle, one of said loop forming means sequentially captures a first segment of filament and pulls it into a first loop, the circumferentially adjacent loop forming means captures another segment of filament and pulls it into a second loop through the first loop, and the loops are released by their respective loop forming means after at least one loop of filament has been pulled therethrough.

3,971,233

CIRCULAR KNITTING MACHINE WITH PATTERN PRODUCING DEVICES

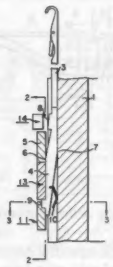
Yukio Amaya, Ohbu, and Kazufusa Sakakura, Kariya, both of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Nov. 14, 1974, Ser. No. 523,878

Claims priority, application Japan, Nov. 22, 1973, 48-134686

Int. Cl.[2] D04B 9/00

U.S. Cl. 66—50 R 3 Claims



1. A circular knitting machine including a cylinder provided with needle slots; a series of independently operable knitting needles disposed in said needle slots; a series of needle operating jacks having fulcra at the mid-portions thereof and being disposed, one for each needle, in said needle slots in abutting end to end relation with lower ends of said needles and disposed in said slots for pivotal movement about said fulcra and for reciprocating movement along said needle slots, each of said jacks having a one-piece integral structure, and being provided at the opposite end portions with outwardly extending lower and upper butts; a camming mechanism disposed along a circumferential surface of said cylinder, said camming mechanism comprising needle raising cams engagable with one of the butts for causing one of the butts on each of said jacks to move upwardly along said needle slot when it engages said needle raising cams, and jack turning cams engagable with each of said one of the butts to turn said jack from a position in which it can be raised by said needle raising cams to a position in which it cannot be raised by said raising cams; a series of jack holding means disposed so as to correspond in position to the other of the butts of each of said jacks for magnetically holding particular jacks, which are not to bring about a knitting operation, among said jacks having been turned by said jack turning cams to said position in which said jacks cannot be raised by said needle raising cams, said jack holding means being circumferentially disposed outwardly of the series of needle operating jacks for acting on the other of said butts, each of jack holding means comprising two permanent magnets and one electrical magnet interposed between said permanent magnets, said three magnets being transversely aligned in contact with each other; and resilient spring means for normally urging said one of the butts on each of said jacks toward said needle raising cams and said jack turning cams, said resilient spring means being disposed inwardly of the series of needle operating jacks.

3,971,234

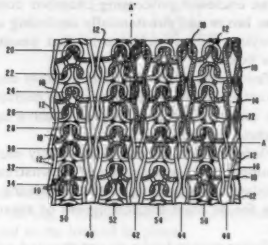
DOUBLE-KNIT ELASTIC FABRIC WITH RAISED PATTERNS

Harold J. Taylor, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 4, 1974, Ser. No. 503,180

Int. Cl.[2] D04B 9/06

U.S. Cl. 66—200 11 Claims



1. A fabric having courses knit with front and back wales, said courses comprising an elastic and an inelastic yarn knit together as a pair as one component and an inelastic yarn alone as the other component, said one component appearing in spaced groups of uninterrupted walewise series of stitches in adjacent front wales and in selected stitches in at least every fourth course in the back wales, all the remaining stitches in the fabric being the other component.

3,971,235

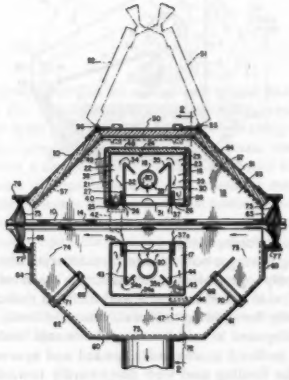
HIGH PRODUCTION STEAMER

Robert Frezza, Carle Place, N.Y., assignor to Samcoe Holding Corporation, Woodside, N.Y.

Continuation-in-part of Ser. No. 348,068, April 5, 1973, Pat. No. 3,875,624, and a continuation-in-part of Ser. No. 355,401, April 30, 1973, Pat. No. 3,868,215. This application Jan. 28, 1975, Ser. No. 544,840

Int. Cl.[2] D06B 3/20, 23/18

U.S. Cl. 68—5 E 12 Claims



1. A high production processing steamer for imparting moisture to tubular knitted fabric or the like, comprising

a. means for conveying the fabric in relatively flat form along a predetermined, generally horizontal processing plane,

b. a pair of steam boxes mounted in opposed relation, one above and one below the processing plane,

c. said steam boxes having effectively continuous slot-like steam discharge openings extending across the width of the fabric and arranged to direct opposed, high velocity streams of steam toward the fabric generally perpendicular to the processing plane, from above and below said plane, and

d. confining means above and below the processing plane forming an enclosed processing chamber containing the said steam boxes and substantially enclosing a portion of the conveying means inclusive of that passing between the steam boxes,

e. said confining means substantially entirely enclosing said steam boxes and limited portions of the conveying means upstream and downstream thereof relative to the direction of fabric movement,

f. said confining means having transversely elongated slit-like openings in its upstream and downstream sides to accommodate the presence of the conveying means and providing for at least limited egress of steam from the chamber,

g. said confining means being so constructed and arranged as to temporarily confine steam ejected from the steam boxes to a limited region closely surrounding the fabric, and

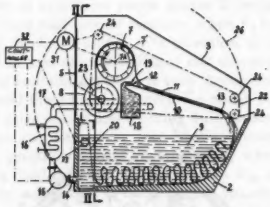
h. forced draft steam exhaust means communicating with said confining means below said processing plane,

i. said confining means being substantially closed in the regions above said processing plane, whereby confined steam above said plane is withdrawn through said fabric and removed through said exhaust means.

3,971,236
APPARATUS FOR TREATING AN ELONGATED WEB WITH A LIQUID

Armand Jean Bene, 17, route de Toussieu, Manissieux 69800 Saint-Priest, France

Filed July 29, 1974, Ser. No. 492,873
Claims priority, application France, July 30, 1973, 73.28408
Int. Cl.² D06B 3/28, 23/04
U.S. Cl. 68—176 1 Claim



1. An apparatus for treating an elongated web with a liquid, said apparatus comprising:

a housing having a bottom and formed at its bottom with an upwardly open vessel containing a bath of a treating liquid, said vessel having a wall inclined downwardly and inwardly for guiding said web into said bath;

a plate disposed in said housing above said bath, said plate being inclined downwardly toward and spaced from said wall for feeding said web downwardly toward the latter, said plate extending substantially horizontally in said housing and having an upper and a lower edge;

a drum rotatably mounted in said housing and disposed above and along said upper edge of said plate for laying said web onto the latter;

nozzle means for feeding a treating liquid onto said plate below said web whereby said web contacts said liquid on said plate, the liquid on said plate cascading into said bath at the lower edge of said plate;

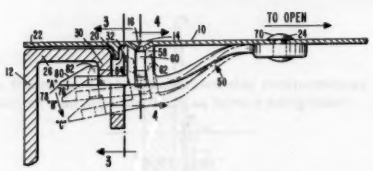
an auger rotatably mounted in said housing between said bath and said drum and having a helical rib, said web having turns separated by said rib as said web rises from said bath onto said drum; and

means for driving said auger and said drum.

3,971,237
DOOR LOCK

Holgar Rasmussen, Kilchberg, Switzerland, assignor to Georgia-Pacific Corporation, Portland, Oreg.

Filed July 9, 1975, Ser. No. 594,256
Int. Cl.² E05B 65/08; E05C 19/06
U.S. Cl. 70—99 16 Claims



1. A lock for securing a door member to a frame member, said lock comprising:

means defining a lock opening having first and second edge portions on one of said members,

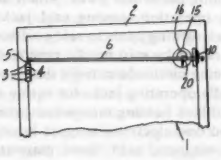
a catch element mounted on the other of said members, said catch element having a free end portion extendable through said lock opening when said door member is closed, said free end portion having first and second locking shoulders extending outwardly in different directions, said free end portion being movable between a first position wherein said first shoulder is engageable with said first edge portion to prevent said door from being opened, a second position wherein said second shoulder is engageable with said second edge portion to prevent said door from being opened, and a third position intermediate said first and second positions wherein both of said shoulders can pass freely through said lock opening to allow said door to be opened, said free end portion being biased toward said first position, and

key means engageable with said catch element to move said free end portion between said first position and said third position.

3,971,238
KEY ACTUATED AUXILIARY DOOR HOLDING MEANS

Brooks Walker, 807 Francisco St., San Francisco, Calif. 94109

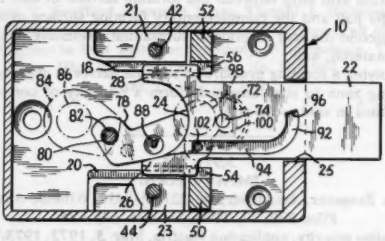
Filed Mar. 31, 1975, Ser. No. 563,570
Int. Cl.² E05B 65/06
U.S. Cl. 70—135 11 Claims



1. A door lock for use with a door structure that includes a door and a frame therefor, comprising:

a rod extending alongside the inner face of said door,
a keeper mounted on said frame,
said rod being movable vertically in a plane parallel to said inner face from a locked position in engagement with said keeper to an unlocked position out of engagement with said keeper,
a base rotatably mounted on said inner face of said door,
a rod holder on said base and slidably engaging said rod at a point intermediate the ends of the latter,
means extending through said door from the opposite face thereof for rotating said base to move said rod between locked and unlocked positions.

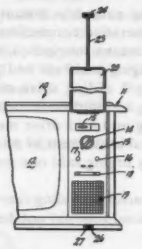
3,971,239
LOCK
Stanley Lavis, Little Ferry, N.J., assignor to Phelps Time Recording Lock Corporation, New York, N.Y.
Filed Feb. 7, 1975, Ser. No. 548,013
Int. Cl.² E05B 65/06, 9/00
U.S. Cl. 70—134 **1 Claim**



1. A lock having a casing and a cover, a bolt mounted for sliding movement in said casing, said bolt having a pair of flanges thereon, said casing having a bolt receiving opening in one end thereof, said opening being completely surrounded by the material of the casing, said bolt being slidable between an advanced and retracted position relative to said casing, said bolt extending through said opening in said advanced position; and means on said cover for engaging the bolt to prevent removal of said cover when said bolt is in said advanced position comprising a pair of projections mounted on said cover and extending into said casing, said projections each being L-shaped, each of said flanges resting in a different one of said L-shaped projections at least when said bolt is in the advanced position, said cover being locked to said casing by the projections and by the engagement of the bolt with the casing in the advanced position of said bolt said projection engaging the bolt in both the advanced and retracted positions of the bolt.

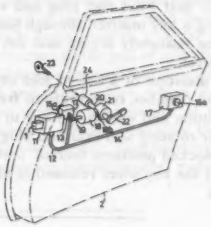
3,971,240
LOCKING COVER FOR TELEVISION CONTROLS
John A. Love, Sr., 30 Somerset St., Battle Creek, Mich. 49017
Filed June 22, 1971, Ser. No. 155,559
Int. Cl.³ B65D 55/14
U.S. Cl. 70—160 **1 Claim**

1. In combination with a television set having a cabinet containing an electrical chassis, a picture tube, primary television controls exteriorly accessible, a loudspeaker and a loudspeaker port:
a a primary control cover hingedly mounted at one edge of said cabinet and arranged alternatively to expose said primary controls including an on-off switch and a channel selector switch or to cover all the primary controls, and
b locking means for locking the cover in place over the controls thereby preventing manipulation of the controls while the cover is in a closed and locked position,
c said cover and said locking means being so arranged that sound emanating from the loudspeaker port is not adversely affected or attenuated,
d said locking means comprising a rod extending across said loudspeaker port and having one end affixed to said cover and having a slot provided at the other end thereof, hasp means mounted on said cabinet adapted to be engaged by



said slot when said cover is in closed position and padlock means having a shackle adapted to extend through said hasp and to be locked in place.

3,971,241
OPERATING DEVICE FOR LOCKING MECHANISMS IN DOORS, HATCHES AND THE LIKE
Nils Owe Pärsson, Trollhattan, Sweden, assignor to Saab-Scania Aktiebolag, Sodertalje, Sweden
Filed Sept. 23, 1974, Ser. No. 508,716
Claims priority, application Sweden, Sept. 24, 1973, 7312946
Int. Cl.² E05B 51/02
U.S. Cl. 70—275 **6 Claims**



1. An operating device for a lock-bolt or the like for doors, hatches or the like comprising an actuating means for the lock-bolt, at least two manually operable releasing means and pipes which connect the actuating means with the releasing means to form a closed system filled with a liquid for transferring a volume change in one of the releasing means into a corresponding volume change in the actuating means for the lockbolt, said system including an expansion means coacting with a manually operable latching means which in at least one position limits expansion of the expansion means by contact therewith, each of the actuating, releasing and expansion means including a flexible bellows, one end of a bellows being closed and the other end of a bellows being in communication with the closed system.

3,971,242
KEY EJECTOR LOCK
Aloysius J. Mikos, Skokie, Ill., assignor to Chicago Lock Co., Chicago, Ill.
Filed July 25, 1975, Ser. No. 599,154
Int. Cl.² E05B 17/00, 27/08
U.S. Cl. 70—388 **13 Claims**

1. A key ejector lock which comprises:

a tubular barrel,

a front end plug rotatably mounted in said barrel and having a keyway extending therethrough for operation thereof by a key,

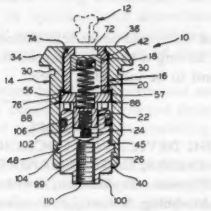
a rear end plug rotatably mounted in said barrel and adapted for operative connection to a locking member,

rotatable drive means interposed between said plugs and drivingly engaging said rear end plug,

means providing a sliding drive connection between said front end plug and said drive means, one member of said front end plug and said drive means being mounted for axial reciprocal movement in said barrel,

means resiliently urging said one member forwardly in said barrel,

means on said barrel providing rearwardly opening circumferentially spaced internal notches,



lug means projecting outwardly from said one member, said lug means being removably received in respective ones of said notches for securing said rear end plug in respective locked and unlocked rotational positions,

a key ejector axially reciprocally movable in said barrel between said front end plug and said drive means and engaging a key inserted through said keyway,

and means resiliently urging said key ejector forwardly in said barrel,

whereby insertion of a key in said keyway serves to move said one member rearwardly to free the rotatable parts for rotation and enable the key to rotate said front end plug for rotating said rear end plug between said locked and unlocked positions thereof, and said key ejector acts to eject the key when released in any rotational position thereof.

3,971,243

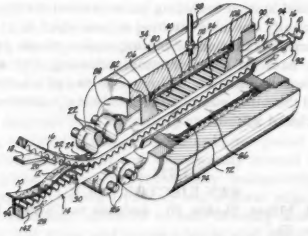
METHOD FOR DIE FORMING STRIP MATERIAL

Everett E. Jones, Wichita, Kans., assignor to The Boeing Company, Seattle, Wash.

Division of Ser. No. 461,995, April 18, 1974, Pat. No. 3,888,618. This application Jan. 9, 1975, Ser. No. 539,745

Int. Cl.² B21D *13/02*

U.S. Cl. 72—385 **8 Claims**



1. A method for die-forming a strip of material capable of undergoing plastic deformation comprising:

feeding a first die half into superposed relationship with a second die half at a first location upstream from a forming zone, said first die half being an elongate, flexible die member having a corrugated forming surface running longitudinally thereof, said second die half having a corrugated forming surface complementary to the forming surface on said first die half, said second die half being fed to said first location along a predetermined path from a second location upstream from said first location, said first die half being fed to said first location along an arcuate path from a third location upstream from said first location, said third location being transversely spaced from and adjacent said second location relative to the feed direction of said second die half along said predetermined path,

feeding said strip of material into sandwiched relationship between said first die half and a second die half at said first location upstream from said forming zone, said strip being fed between said first and second die halves at said first location in a manner to gather sufficient material from said strip between the forming surface of said first die half and the complementary forming surface of said second die half to prevent substantial stretching of said material, and

applying a forming pressure to said die halves in said forming zone to simultaneously form a plurality of corrugations in said metal strip.

3,971,244

IMPACT TOOL

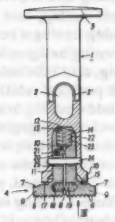
Hans Zengerer, Bundesstrasse 221, A-8410 Wildon, Austria

Filed Feb. 27, 1974, Ser. No. 446,536

Claims priority, application Austria, Mar. 5, 1973, 1923/73

Int. Cl.² B21D *1/12, 25/00;* **B21J** *7/18, 13/02*

U.S. Cl. 72—395 **9 Claims**



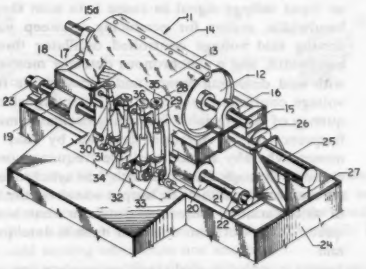
1. A portable impact tool for dressing metal sheets, comprising a tool carrier having a take-up bore formed therein provided with guide surfaces and a closed inner end, a tool head positioned exteriorly of said carrier, a stem joined to said tool head and mounted in said carrier, said stem being slidably guided along said guide surfaces of said take-up bore and being spaced from said inner end when the tool is in a rest position, wherein a gap is formed between the stem and the inner end of said bore, aligned transverse openings formed in said carrier, transverse openings formed in said stem in alignment with the openings in said carrier and having a diameter that is greater than that of said openings, a transversely extending stop member fixed in the openings in said carrier and being loosely received in the openings in said stem and being engageable by said stem wherein the stem is limited in the movement thereof, a spring located in said take-up bore and abutting against said closed end thereof and against said stem so that said spring bridges said gap for resiliently loading said tool head in a longitudinal direction with respect to said tool carrier, said tool head having an outer face provided with serrations and that is divided transversely into at least two tool head portions, said tool head portions being movable relative to each other and being slidably guided within the tool carrier along said guide surfaces, each of said tool head portions

including a jaw that is engageable with said metal sheets, a rigid abutment for said jaws defined by a surface formed on said tool carrier adjacent to said jaws, said jaws being movable in longitudinal direction of said take-up bore, whereby said abutment and said stop member defines the limit of longitudinal movement of said jaws, the inner and outer ends of said take-up bore being formed with inclined surface portions that diverge in a direction toward said jaws, said tool head having first and second inclined surfaces portions that are axially and longitudinally spaced from one another in said take-up bore and that cooperate with said bore to move said jaws into engagement with each other when said jaws strike the metal sheets to be treated, and resilient means interposed between said jaws and abutting thereagainst for maintaining said jaws laterally spaced from one another, when said jaws are in a rest position.

3,971,245
WEAR TESTING DEVICE

Joseph C. Crafford, Newport News; Vincent J. Dowling, Jr., Yorktown, and James A. Gusack, Williamsburg, all of Va., assignors to Dow Badische Company, Williamsburg, Va.

Filed June 18, 1975, Ser. No. 587,932
Int. Cl.² G01N *3/56*
U.S. Cl. 73—7 **6 Claims**



1. A device for the wear testing of fabric samples such as carpets, which device comprises:

a. a cylinder for supporting the sample to be wear tested, the cylinder having means for securing the inner surface of the sample in congruity with the exterior of the major surface of the cylinder;

b. mounting means for permitting rotation of the cylinder about its longitudinal axis and simultaneous reciprocation of the cylinder along its longitudinal axis;

c. a plate affixed on one major surface thereof to a rod, the free major surface of the plate positioned so that it may contact the outer surface of the sample;

d. a crankshaft, to which the free end of the rod is attached, and by means of which a reciprocating motion is imparted to the rod, so that the plate is moved back and forth from a position away from the sample to a position in contact with the sample;

e. means for allowing simultaneous reciprocation and oscillation of the rod so that as contact between the plate and the sample is effected, the cylinder is caused to rotate about its longitudinal axis;

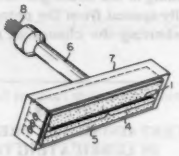
f. means for mounting and driving the crankshaft; and

g. means affording reciprocation of the cylinder along its longitudinal axis.

3,971,246
METHOD AND APPARATUS FOR MEASURING THE COEFFICIENT OF THERMAL CONDUCTIVITY OF A SAMPLE

Sadao Sumikama; Nobuyoshi Tanaka; Yoshiaki Arakawa, and Katsushi Akama, all of Tokyo, Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 13, 1973, Ser. No. 424,276
Claims priority, application Japan, Dec. 21, 1972, 47-127653; Sept. 26, 1973, 48-108178; Sept. 26, 1973, 48-107514
Int. Cl.² G01N *25/18*
U.S. Cl. 73—15 A **4 Claims**

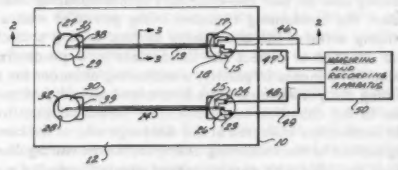


1. Apparatus for measuring the thermal conductivity of a sample comprising a rectangular cover means having an open end, a stick, one end of which is connected to said cover means, a reference material inserted in said cover means so that the flat surface of said reference material is on said open end of said cover means, the thermal conductivity of said reference material being known, a long linear electric heater having a resistance $R=R_0(1+\beta T)$ mounted on the surface of said reference material, said electric heater being connected to a current source, a thermo-electric couple connected to the surface of the middle part of said heater, said thermo-electric couple being electrically connected to a meter to measure temperature, a plug attached to the end of said stick for electrically connecting said heater and said thermo-electric couple to the current source and to the meter, where R_0 and β are constants and T is an average temperature of the electric heater, said thermo-electric couple measuring the temperature of said heater at least at two predetermined different times before the reference-sample-heater system reaches thermal equilibrium.

3,971,247
FLUID MEASURING APPARATUS

Jerome A. Rodder, 775 Sunshine Drive, Los Altos, Calif. 94022

Filed Nov. 15, 1974, Ser. No. 523,995
Int. Cl.² G01F *1/68*; G01N *31/00*
U.S. Cl. 73—27 R **23 Claims**



1. Fluid measuring apparatus comprising:

a housing having an elongated cavity enclosed on its sides and open at its ends;

a thin elongated, i.e., uncoiled, hot wire bent in half to extend along the length of the cavity;

first means at one end of the cavity for supporting the ends of the wire in fixed relationship longitudinally and later-

ally with respect to each other and electrically isolated from each other;

second means at the other end of the cavity for supporting the middle of the wire, the second wire supporting means comprising a deformed spring that exerts tension on the middle of the hot wire to keep the hot wire taut as its length changes, permits longitudinal movement of the middle of the wire, and prevents lateral movement of the middle of the wire, the first and second supporting means cooperating to maintain the halves of the wire in spaced approximately parallel relationship from each other and in spaced relationship from the sides of the cavity;

means for forming in the housing a fluid entrance to the cavity;

means for forming in the housing a fluid exit from the cavity longitudinally spaced from the entrance; and

means for measuring the change in resistance of the hot wire.

3,971,248

UNIT FOR ASCERTAINING THE PRESENCE OF WATER IN LUBRICATING OIL

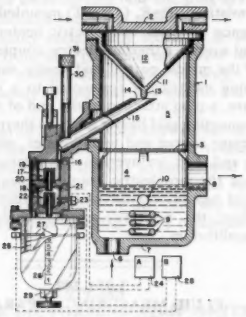
Arne Orskov Christensen, 14, Glentevej, DK-9900 Frederikshavn, Denmark

Filed Feb. 1, 1974, Ser. No. 438,655

Claims priority, application Denmark, Dec. 14, 1973, 6809/73

Int. Cl.[2] G01N *25/14*, *33/26*

U.S. Cl. 73—61.1 R **6 Claims**



1. An apparatus for ascertaining the presence of water in an oil, comprising a condensing chamber, a heating chamber for heating said oil, said two chambers communicating with each other, the condensing chamber being provided with a condensing surface, the condensing surface having a discharge end adapted to collect the condensate at a predetermined location by means of gravity, a measuring chamber for ascertaining the presence of a predetermined quantity of condensate in the chamber, communicating means adapted to feed the condensate collected at the discharge end of the condensing surface to the measuring chamber, the measuring chamber being provided with warning means adapted to emit a warning signal when the water in the measuring chamber reaches a predetermined quantity and a fore-chamber provided between the communicating means and the measuring chamber, the communicating means discharging into the fore-chamber, the fore-chamber being adapted to collect a predetermined quantity of condensate and provided with outlet means for delivering the quantity thus collected as a whole into the measuring chamber.

3,971,249

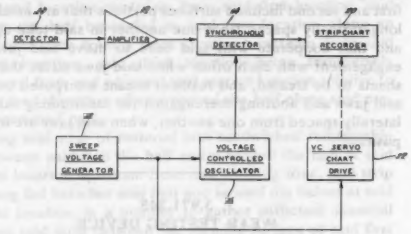
MECHANICAL TESTING SYSTEM

Henry L. Bachofer, Newtown Square, Pa., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Mar. 28, 1975, Ser. No. 563,019

Int. Cl.[2] G01H *1/08*

U.S. Cl. 73—67 **1 Claim**



1. A system for checking the condition of mechanical apparatus and comprising:

a. means for detecting vibrations in the mechanical apparatus within a given bandwidth;

b. means for systematically scanning through the frequencies of the detecting vibrations in said bandwidth and including a variable frequency, voltage controlled oscillator, the output frequency of which may be controlled by an input voltage signal to cause it to scan through said bandwidth, means for producing a sweep voltage for driving said voltage controlled oscillator through said bandwidth, and a synchronous detector means, coupled with said detecting means and said variable frequency, voltage controlled oscillator, for detecting when the frequency of said variable frequency oscillator matches the frequency of a vibration detected by said detecting means, whereby as said variable frequency oscillator is scanned through the bandwidth said synchronous detector means will produce an output whenever the frequency of said variable frequency oscillator matches the frequency of a vibration detected by said detecting means; and

c. means, coupled to said synchronous detector means and said means for producing a sweep voltage, for recording the amplitude of the output of said synchronous detector means as a function of the frequency of said voltage controlled oscillator, whereby the recording of amplitude versus frequency may be utilized to diagnose the condition of the mechanical apparatus.

3,971,250

ELECTRET SENSING MEDIUM HAVING PLURAL SENSING UNITS

Allen L. Taylor, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 18, 1975, Ser. No. 550,536

Int. Cl.[2] G01B *7/16*; G01K *7/00*; H01G *7/02*

U.S. Cl. 73—88.5 R **7 Claims**

1. A temperature compensated sensor comprising the combination of:

a first sensing unit formed of:

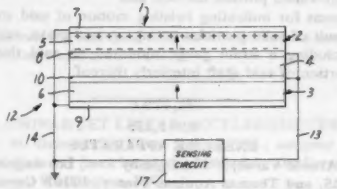
a first layer of poled pyroelectric material that produces electrostatic charges on its planar surfaces when its ambient temperature is varied, the charges on a first planar surface of said layer being opposite in polarity to the charges on a second planar surface of said layer;

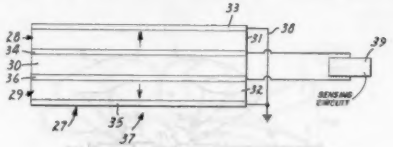
a first pair of conductive plates in surface-to-surface contact with said pyroelectric layer, said pair of plates including a first plate disposed on said first surface of said layer, and a second plate disposed on said second surface of said layer;

a second sensing unit formed of:

a second layer of poled pyroelectric material that produces electrostatic charges on its planar surfaces when its ambient temperature is varied, the charges on a first planar surface of said second layer being opposite in polarity to the charges on a second planar surface of said second layer and also opposite in polarity to the charges on the second surface of said first layer; and

a second pair of conductive plates in surface-to-surface contact with said second pyroelectric layer, said pair of plates including a first plate disposed on said first surface of said layer, and a second plate disposed on said second surface of said layer; and





a layer of thermally and electrically insulative material interposed between said first and second sensing units and in surface-to-surface contact with one of the conductive plates of each of said sensing units to thermally isolate said sensing units from one another;

connecting means for electrically interconnecting various plates of said pairs to form two sets of interconnected plates, each set including at least one plate on one surface of said first pyroelectric layer and at least one plate on the surface of said second pyroelectric layer; and

a sensing means connected to said two sets of interconnected plates for detecting electrostatic charges on at least one of said two sets of plates only when said plates are not similarly varied in temperature.

3,971,251

DYNAMICALLY BALANCED APPARATUS FOR WATER BORNE INSTRUMENTS

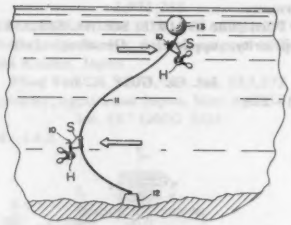
Shale J. Niskin, 2941 Lucaya St., Miami, Fla. 33133

Filed Apr. 16, 1975, Ser. No. 568,556

Int. Cl.² G01D *21/00*

U.S. Cl. 73—170 A **9 Claims**

1. A dynamically balanced apparatus for water borne instruments comprising an elongated member having horizontal and vertical axes and arm portions extending along said horizontal axis, support means rotatably supporting said arm portions in a substantially balanced position whereby said horizontal axis lies in the horizontal plane, pivot means mounted on said support means permitting the pivotal movement of said arm portions in said horizontal plane, weighted means secured to said arm portions compelling said arm portions to rotate about said horizontal axis to assume a predetermined position, at least one vane mounted on said support means lying in a substantially vertical plane parallel to said vertical axis and at right angle to said horizontal axis and water flow actuating means mounted on each of said arm portions substantially



equidistant from said support means and along said horizontal axis.

3,971,252

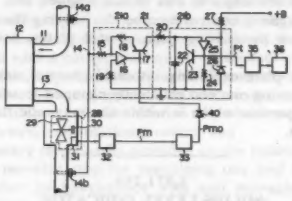
ELECTRONIC INTEGRATION CALORIMETER

Hajime Onoda, Tokyo, Japan, assignor to Kimmon Manufacturing Co., Ltd., Tokyo, Japan

Filed Apr. 11, 1975, Ser. No. 567,178

Int. Cl.² G01K *17/16*

U.S. Cl. 73—193 R **5 Claims**



1. An electronic integration calorimeter comprising:

a temperature difference detecting device for generating a first electrical signal having an amplitude proportional to a difference between the temperature of a heat medium flowing into a heat load and the temperature of the heat medium flowing out of the heat load, the first electrical signal being one of a voltage and current signal;

a flow pulse generator mounted in a flow passage of the heat medium and generating a flow pulse signal wherein the number of pulses per unit time of the flow pulse signal is proportional to the rate of flow of the heat medium;

a voltage-current conversion circuit coupled to the temperature difference detecting device and to the flow pulse generator to convert the first electrical signal produced from the temperature difference detecting device into a second electrical signal in response to the flow pulse signal, the second signal having an amplitude which is function of the first electrical signal and a pulse rate which is a function the flow pulse signal, and the second electrical signal being one of a current and voltage signal when the first electrical signal is respectively one of a voltage and current signal;

an A-D converter coupled to the voltage-current conversion circuit to convert the second electrical signal into a second pulse signal wherein the number of pulses of the second pulse signal is proportional to the amplitude of the second electrical signal; and

a counter coupled to the A-D converter for counting the pulses of the second pulse signal from the A-D converter.

3,971,253

FLOW METER WITH A MAGNETIC FIELD-DEPENDENT RESISTOR ARRANGEMENT

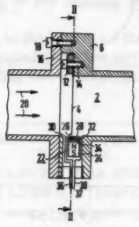
Paul Hini, Erlangen-Kosbach, and Bernt Paul, Erlangen, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed June 19, 1975, Ser. No. 588,236

Claims priority, application Germany, July 19, 1974, 2434864

Int. Cl.² G01F *1/28*

U.S. Cl. 73—228 **4 Claims**



1. A flow meter for use with a flowing medium comprising:
a housing having a channel therein through which said medium can flow;
a field dependent resistor arrangement including:
a permanent magnet; and
first and second magnetoresistive field plates arranged to be in the magnetic flux of said magnet; and
a ferromagnetic control member for varying the degree of said flux permeating each of said plates, said control member including:
a throttle plate extending into said channel, said throttle plate having one end elastically clamped to said housing and a portion which is within the magnetic flux of said magnet.

3,971,254

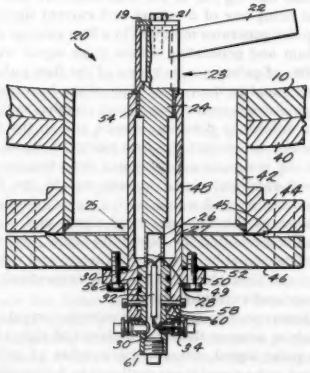
SOLIDS LEVEL INDICATOR

Micheal I. Sherman, Glen Falls, N.Y., assignor to Kamyr, Inc., Glens Falls, N.Y.

Filed Jan. 8, 1975, Ser. No. 539,384

Int. Cl.² G01F *23/00*

U.S. Cl. 73—290 R **20 Claims**



1. A detector for indicating the solids level in a vessel or the like adapted to have solid particles flowing downwardly therein, the vessel or the like having a generally vertical axis, said detector comprising
a. a shaft having an axis passing through the center thereof,
b. means for fixedly mounting said shaft at a first end thereof to the vessel or the like and for allowing a second end thereof to be freely mounted, said second end extending into the vessel or the like,
c. a generally flat plate,
d. means for rigidly mounting one end of said plate to said second end of said shaft, said plate being perpendicular to said shaft axis, and generally perpendicular to the axis of the vessel or the like,
e. a thin-walled portion of said shaft located adjacent said first end thereof, said shaft being generally tubular at said thin-walled portion thereof, and
f. means for indicating twisting motion of said shaft as a result of solid particles acting on said plate, said means including a strain gauge mounted on said thin-walled portion of said shaft interiorly thereof.

3,971,255

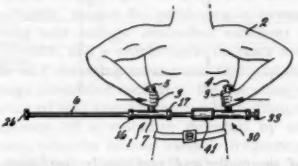
EXERCISE APPARATUS

Justin Arnold Varney, 7326 Oglesby Ave., Los Angeles, Calif. 90045, and Thomas Aquinas Feeney, 10108 Gaynor Ave., Sepulveda, Calif. 91343

Filed Aug. 4, 1975, Ser. No. 601,599

Int. Cl.² G01L *5/02*

U.S. Cl. 73—379 **14 Claims**



11. An exerciser device comprising
a shaft;
a housing slidably mounted on said shaft, said housing including means for selectively varying the degree of frictional engagement between said shaft and said housing; and
applied force indicating means operatively associated with said shaft whereby the level of a force tending to cause axial movement of said shaft relative to said housing may be observed.

3,971,256

METEOROID CAPTURE CELL CONSTRUCTION

Herbert A. Zook, and Richard W. High, both of Houston, Tex., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

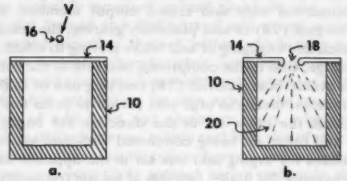
Filed Mar. 5, 1974, Ser. No. 448,320

Int. Cl.² G01N *1/00*

U.S. Cl. 73—425.2 **3 Claims**

1. A meteoroid capture cell comprising:
a. A housing for receiving and restraining particles from shattered meteoroids of a pre-selected size class, said housing being constructed entirely of one chemical substance having a purity of at least 0.9999 and having one open side for receiving therethrough said particles and wherein the thickness of said housing substance is resistant to complete penetration by said particles; and,
b. A membrane comprised of the same chemical substance as said housing affixed to and covering the open side of said housing wherein the thickness of said membrane is

responsive to penetration by a meteoroid of said preselected size class striking said membrane while causing



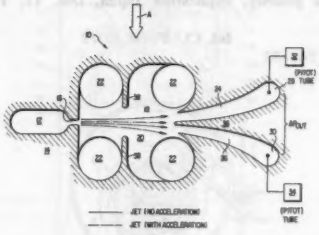
complete shattering of said meteoroid as said meteoroid penetrates said membrane.

3,971,257

LAMINAR JET LINEAR ACCELEROMETER

Tadeusz M. Drzewiecki, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 14, 1975, Ser. No. 604,736
Int. Cl.² G01P *15/02*
U.S. Cl. 73—515 **4 Claims**



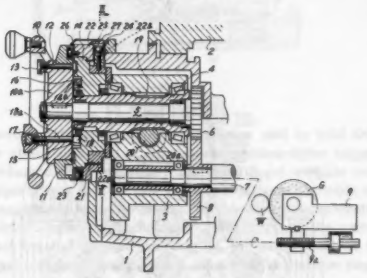
1. An improved laminar jet linear accelerometer, comprising:
- a housing;
- a first chamber defined within said housing and into which a pressurized fluid is supplied;
- a second chamber fluidically connected to said first chamber, said second chamber vented to an ambient environment through a plurality of vents to prevent pressure build-up within said second chamber;
- means defining a nozzle operatively associated with said first chamber for issuing said fluid from said first chamber and into said second chamber in the form of a laminar jet and along a predetermined axis;
- sensing means, fluidically connected downstream from said second chamber and disposed symmetrically about said predetermined axis within fluid channels, for sensing and indicating a differential fluidic output characteristic of said fluid,
- whereby under non-acceleration conditions, said differential output will be zero as said fluid flows along said axis and uniformly impinges upon said sensing means, while under applied acceleration conditions, said differential output will not be zero as said fluid flow will be deflected away from said axis by said applied acceleration so as to non-uniformly impinge upon said sensing means;
- flow splitter means integrally formed with said housing for facilitating the flow of said fluid into said channels toward said sensing means, said flow splitter means disposed co-axially with said flow axis and includes a sharply tapered upstream portion extending into said second chamber; and
- swirl attenuation vanes, disposed within said second chamber, for preventing recirculation and backflow of said fluid toward said nozzle.

3,971,258

FEED MECHANISM FOR A MACHINE TOOL

Akiyoshi Kobayashi, Kariya, Japan, assignor to Toyoda Koki Kabushiki Kaisha, Japan

Filed Feb. 26, 1975, Ser. No. 553,272
Claims priority, application Japan, Mar. 4, 1974, 49-25553
Int. Cl.² G05G *5/04*
U.S. Cl. 74—10.2 **8 Claims**



1. A feed mechanism for a machine tool comprising:
- a shaft rotatable for supplying a feed movement to a movable unit of said machine tool in a machining operation;
- drive means capable of reversibly turning said shaft;
- a ring member rotatable together with said shaft and provided with a cut-out portion;
- a movable stop rotatable in axial alignment with said ring member and engaged within said cut-out portion for permitting a relative rotation therebetween through a predetermined rotational extent; and
- a stationary stop fixedly provided on the rotational path of said movable stop for restraining one end of said ring member by interference with said movable stop, said predetermined rotational extent being defined to be more than the sum of widths of said movable stop and said stationary stop so that said shaft may be turned within a range of less than two revolutions.

3,971,259

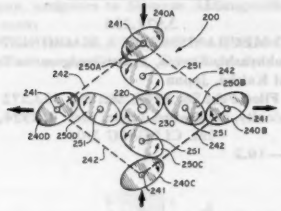
FLUID TRANSDUCER

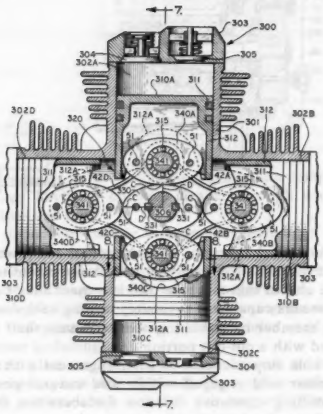
Henry Schottler, SE. Lamon Lane, Fort Pierce, Fla. 33452

Filed Jan. 2, 1974, Ser. No. 430,332
Int. Cl.² F16H *21/16*
U.S. Cl. 74—25 **9 Claims**

1. A fluid transducer for imparting energy to or receiving energy from a fluid comprising:
- central rotary shaft means;
- a plurality of reciprocatory piston members disposed around said central shaft means within piston cylinders;
- a first elliptical member having selected major and minor diameters and positioned within said transducer for rotation about its elliptical center as said shaft member rotates;
- a plurality of second elliptical members having substantially the same major and minor diameters as the first elliptical member, each of said second elliptical members being mounted in said transducer to rotate about its elliptical center and to reciprocate in response to the reciprocation of one of said piston members;
- said second elliptical members being arranged in engagement with said first elliptical member so that said first and second elliptical members rotate in unison with constant angular velocity as said piston members and said second

elliptical members reciprocate with respect to said rotary shaft means; and





means to retain said second elliptical members in said engagement with said first elliptical member whereby said drive mechanism transmits motion between said pistons and said rotary shaft means.

3,971,260

POWER TRANSMISSION APPARATUS

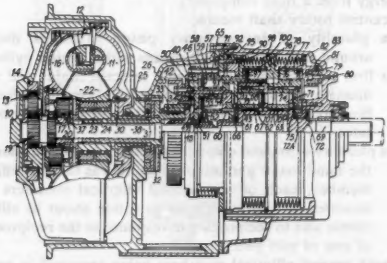
Howard Frederick Hobbs, Napton-on-the-Hill, England, assignor to Variable Kinetic Drives, Ltd., England

Filed Aug. 28, 1974, Ser. No. 501,414

Claims priority, application United Kingdom, Sept. 4, 1973, 41542/73

Int. Cl.² F16D *23/00, 43/20;* **F16H** *5/06, 3/74*

U.S. Cl. 74—337.5 **7 Claims**



1. A power transmission apparatus comprising a fixed part (e.g. 79), a rotary input member (e.g. 40) a clutch having engageable input and output clutch members (e.g. 49, 60), means for engaging and releasing the clutch members, said input clutch member being driven by said rotary input member (40), a planetary gearing having an input gear member (61) connected with said clutch output member, a brake acting on part (74) of said planetary gearing, the releasing of said clutch and engaging of said brake serving to effect a down gear change, said brake comprising two sets of friction plates and a movable brake carrier (78) carrying one of said sets of friction plates, means to urge said carrier to press one of said sets against the other set in the direction for engaging the brake, said other set being connected with said gearing part (74), means for urging said one set in the opposite direction for disengaging the brake, two sets of torque transmitting cam teeth (83) on said brake carrier (78) and on said fixed part (79) respectively, said sets of cam teeth being permanently meshed with each other and being so shaped as to transmit reaction torque to said fixed part and applying brake engaging pressure to said carrier and said one set of brake friction plates only when the brake carrier is transmitting reaction torque through said cam teeth to the fixed part.

3,971,261

SLIDE DRIVING DEVICE FOR USE IN METAL WORKING PRESS

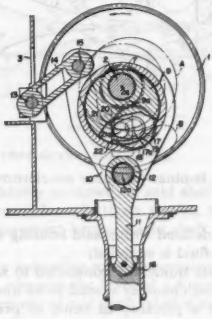
Keiji Matsushita, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Dec. 11, 1974, Ser. No. 531,702

Claims priority, application Japan, Dec. 11, 1973, 48-137382

Int. Cl.² F16H *37/12*

U.S. Cl. 74—52 **1 Claim**



1. In a slide driving device for use in a metal working press including a main shaft rotatably suspended on the device frame, a rotary member fixedly mounted on the main shaft and adapted to be rotated at a constant angular velocity by a driving power source, an eccentric sheave mounted on the main shaft and adapted to be eccentrically rotated about the main shaft, an oscillating link member oscillatingly mounted on the eccentric sheave to eccentrically rotate the eccentric sheave, the oscillating link member being adapted to oscillate in response to the eccentric rotation of the eccentric sheave, a connecting rod pivotally connected between the oscillating link member and the slide, and an eccentric arm shaft connected between the eccentric sheave and the rotary member at their respective offset positions so that rotation of the rotary member is transmitted to the eccentric sheave, the improvement comprising:

a fixed gear serving as a bushing fixedly secured to the device frame at one end of said main shaft;

a planetary or epicyclic gear fixedly secured to one end of said eccentric arm shaft and adapted to mesh with said fixed gear;

a pin shaft eccentrically and rigidly secured through an arm member to the other end of said eccentric arm shaft wherein said eccentric arm shaft, arm member and pin shaft form an integral crank shaft;

a slider rotatably mounted on said pin shaft; and

a long slot formed at a disk part of said rotary member in the radial direction thereof within which said slider is slidably housed, wherein when said rotary member is rotated said eccentric arm shaft is rotated about said main shaft while rotating on its own axis by the co-operative action of said fixed and planetary gears, whereby said slider is slidingly moved within said long slot of said rotary member in the radial direction thereof, and said eccentric sheave is eccentrically rotated about said main shaft at different angular velocities.

3,971,262
FRICTION GEAR

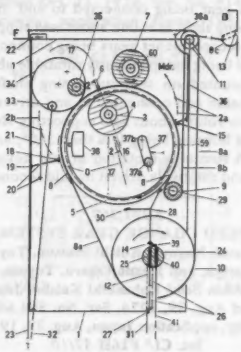
Wilhelm E. Altrogge, P.O. Box 8617, 8202 Schaffhausen, Switzerland

Filed Oct. 15, 1974, Ser. No. 514,743

Claims priority, application Germany, Oct. 17, 1973, 2352014

Int. Cl.² F16H 7/00

U.S. Cl. 74—227 **9 Claims**



1. A friction gear comprising a driven ring having an inside and outside surface, a drive pulley disposed within said drive ring, an elongated flexible tractive member extending around the outside surface of said drive ring with each of the end portions of said member for attachment to a fixed point, a pair of counter pulleys fixedly mounted adjacent the outside surface of the ring and peripherally spaced from each other, said driven ring being pivotable about said drive pulley with the inside surface of said ring in pressure contact with said drive pulley forming a friction zone by an increase in tension on either end of said member with the outside of said ring in contact with a corresponding one of said counter pulleys forming lever for automatically generating sufficient pressure in said friction zone for either of the two directions of rotation of said gear.

3,971,263
VARIABLE DIAMETER PULLEY WITH MEANS FOR CHANGING WEAR PATTERN ON THE PUSHER RING

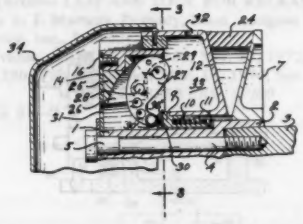
Guy Beaudoin, 1238 Chabanel Street, Drummondville South, Quebec, and Marcel Vincent, 320 Herbert Street, Wickham, Quebec, both of Canada

Filed Jan. 14, 1975, Ser. No. 541,070

Int. Cl.² F16H 55/52

U.S. Cl. 74—230.17 E **4 Claims**

1. A variable diameter pulley comprising shaft means defining the axis of rotation of the pulley, a first and a second pulley flanges coaxially mounted on said shaft means, said first pulley flange being axially displaceable along said shaft means and having axially opposite sides with one of the latter facing said second pulley flange, a pusher ring adjoining the other of said sides of said first pulley flange relative to said one side facing said second pulley flange, a drive member secured to said shaft means and bodily rotatable therewith, a centrifugal weight carrier body circumferentially surrounding said shaft



means and rotatable relative to the latter and to said drive member about said axis of rotation in friction drive engagement with said drive member, and centrifugal weights movably supported by said carrier body in rotatively shiftable and axial engagement with the pusher ring, whereby acceleration of the drive member produces friction drive of the carrier body and inertial angular shifting of the latter and of the centrifugal weights about said axis relative to the pusher ring.

3,971,264
SCREW-AND-NUT MECHANISM WITH BALL OR ROLLER RECIRCULATION

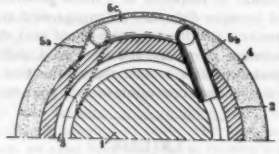
Jacques Detraz, Chambery, and Michel Gambut, La Motte Servolex, both of France, assignors to La Technique Integrale S.A., Chambery, France

Filed May 14, 1974, Ser. No. 469,800

Claims priority, application France, May 16, 1973, 73.17737

Int. Cl.² F16H 1/18

U.S. Cl. 74—459 **5 Claims**



1. In a recirculating ball, screw-and-nut mechanism operable with a plurality of balls situated in at least one helical passage formed by mating grooves of screw and nut members of the mechanism, said passage including axially spaced inlet and exit locations for said balls to enter and exit the passage, the improvement in combination therewith wherein said nut member has an outer surface and inlet and exit bores extending from said surface inward to and entering said helical passage at said inlet and exit locations, said improvement further comprising a molded casing surrounding said nut, and a recirculation channel comprising tubular inlet and exit parts respectively in said inlet and exit bores, each of said parts having one end communicating with said helical passage at said inlet and exit locations and a remote end outward of said outer surface, and a tubular connecting means encased in said casing and interconnecting said two remote ends, thus forming a continuous tube, whereby said balls can, via said recirculation channel, exit and re-enter said helical passage, said inlet and exit parts and connecting means of said recirculation channel being three separable elements.

3,971,265

MANUAL AUTOMOTIVE TRANSMISSION

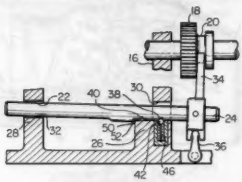
Katsuyasu Kurisu, Kawasaki, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed July 29, 1974, Ser. No. 492,870

Claims priority, application Japan, July 31, 1973, 48-89883[U]

Int. Cl.² B60K 20/08

U.S. Cl. 74—475 1 Claim



1. In a manual automotive transmission having a case, input and output means mounted in said case, gear means operable to connect said input means to said output means, manually operable means including a slidable shifting rod with a fork at one end and supported at opposite ends axially slidably in first and second supports formed on said case, said first support being adjacent said fork and between said second support and said fork, and said shifting rod having a first position wherein said shifting rod allows said gear means to connect said input means to said output means and a second position wherein said shifting rod allows said gear means to disconnect said input means from said output means, said shifting rod being pivotable with said second support as a fulcrum and formed with a step portion selectively engageable with an abutment formed on said first support; the improvement in that said first support has biasing means including a spring biased detent ball disposed in a pocket formed in said first support for biasing said shifting rod in a direction to disengage said step portion of said shifting rod from said abutment of said first support, whereby when said shifting rod takes said first position thereof, said shifting rod is pivoted against the biasing force of said biasing means in response to a force generated by said gear means in another direction to engage said step portion with said abutment, and the engagement of said step portion with said abutment is maintained until said shifting rod is manually operated to slide to said second position by a force produced by the manual operation of said gear means.

3,971,266

POWER TRANSMISSION DEVICE

Tuneho Inakura, Kariya, and Masayuki Doi, Tokyo, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

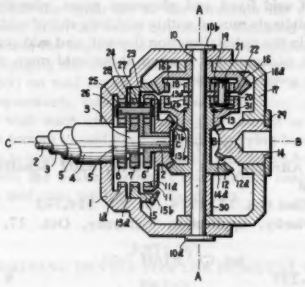
Filed July 16, 1974, Ser. No. 489,037

Claims priority, application Japan, July 17, 1973, 48-81985; July 20, 1973, 48-81479

Int. Cl.² F16H 37/06

U.S. Cl. 74—675 16 Claims

1. A power transmission device used with an industrial manipulator comprising:
- a main body;
- a source of rotational force;
- a first driving shaft rotatably mounted in said main body and coupled to said source of rotational force;
- a second driving shaft rotatably mounted in said main body and coupled to said source of rotational force;
- a supporting shaft mounted in said main body;
- a first epicyclic differential gearing including,
- a first sun gear fixed to said supporting shaft,
- a first planet gear being in mesh with said first sun gear, and
- a first orbit gear rotatably mounted on said supporting shaft and being in mesh with said first planet gear, said first orbit gear being connected and driven by said first driving shaft to rotate about said supporting shaft;
- a second epicyclic differential gearing including,
- a second sun gear rotatably mounted on said supporting shaft,
- a second planet gear being in mesh with said second sun gear, and
- a second orbit gear rotatably mounted on said supporting shaft and being in mesh with said second planet gear, said second sun gear being connected to and driven by said second driving shaft to rotate about said supporting shaft, said first and second planet gears being connected by means of a pin and being independently rotatable about said pin;
- a housing mounted on said supporting shaft for limited pivotal rotation and connected to and driven by said first orbit gear to rotate about said supporting shaft, the rotation of said housing being less than 360°; and
- a driven shaft rotatably mounted in said housing and connected to and rotatively driven by said second orbit gear.



3,971,267

SPEED CHANGE GEAR SYSTEM

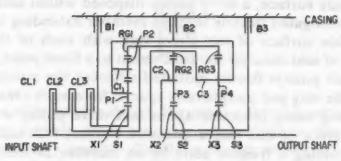
Noboru Murakami, Nagoya; Koichi Matsuo, Toyota; Koichiro Hirosawa, Kariya, and Kazuo Ohara, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Aug. 29, 1974, Ser. No. 501,680

Claims priority, application Japan, Aug. 29, 1973, 48-97514

Int. Cl.² F16H 57/10

U.S. Cl. 74—759 15 Claims



1. A speed change gear system comprising:
- an input shaft;
- a first sun gear;
- a first brake capable of locking said first sun gear to a gear casing;
- a first planetary gear engaged with said first sun gear;
- a secondary planetary gear engaged with said first planetary gear;
- a first ring gear engaged with said secondary planetary gear;
- a first carrier rotatably supporting said first and second planetary gears;
- a second ring gear drivingly engaged to said first carrier;
- a third planetary gear engaged with said second ring gear;
- a second sun gear engaged with said third planetary gear;
- a second carrier rotatably supporting said third planetary gear;

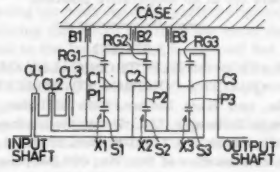
a third sun gear drivingly engaged with said second sun gear;
a fourth planetary gear engaged with said third sun gear;
a third ring gear drivingly engaged with said first ring gear as well as with said fourth planetary gear;
a third carrier rotatably supporting said fourth planetary gear and engaged with said first carrier and said second ring gear;
a first clutch for coupling or uncoupling said input shaft and said first carrier, said third carrier and said second ring gear;
a second clutch for coupling or uncoupling said input shaft and said first ring gear;
a third clutch coupling or uncoupling said input shaft and said first sun gear;
a second brake capable of locking said first carrier, said third carrier and said second ring gear to said gear casing;
a third brake capable of locking said second and third sun gears to said gear casing; and
an output shaft drivingly engaged with said second carrier.

3,971,268

SPEED CHANGE GEAR SYSTEM

Noboru Murakami, Nagoya; Koichiro Hirosawa, Kariya; Koichi Matsuo, and Kazuo Ohara, both of Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Oct. 11, 1974, Ser. No. 514,068
Claims priority, application Japan, Oct. 11, 1973, 48-114097
Int. Cl.² F16H *57/10*
U.S. Cl. 74—759 **15 Claims**



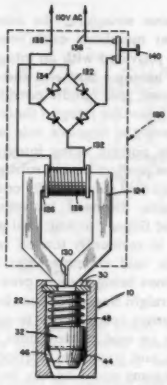
1. A speed change gear system comprising:
an input shaft;
an output shaft;
a first planetary gear set including a first sun gear, a first planetary gear meshed with said first sun gear, a first ring gear meshed with said first planetary gear, a first carrier rotatably supporting said first planetary gear;
a second planetary gear set including a second sun gear, a second planetary gear meshed with said second sun gear, a second ring gear meshed with said second planetary gear and drivingly connected to said first carrier, and a second carrier rotatably supporting said second planetary gear and drivingly connected to said first ring gear;
a third planetary gear set including a third sun gear drivingly connected to said second sun gear, a third planetary gear meshed with said third sun gear, a third ring gear meshed with said third planetary gear and drivingly connected to said carrier and said first ring gear, and a third carrier rotatably supporting said third planetary gear and drivingly connected to said output shaft;
a first clutch for engaging or disengaging said input shaft and said first ring gear and said second carrier and said third ring gear;
a second clutch for engaging or disengaging said input shaft and said first carrier and said second ring gear;
a third clutch for engaging or disengaging said input shaft and said first sun gear;
a first brake for fixedly mounting said first sun gear on a casing;
a second brake for fixedly mounting said first ring gear and said second carrier and said third ring gear to said casing; and
a third brake for fixedly mounting said second sun gear and said third sun gear to said casing.

3,971,269

FASTENING CLIP AND TOOL FOR RELEASING SAME

Martin A. J. Martens, Peabody, Mass., assignor to I. D. Engineering, Inc., Peabody, Mass.

Division of Ser. No. 307,366, Nov. 17, 1972, Pat. No. 3,858,280. This application Mar. 19, 1974, Ser. No. 452,553
Int. Cl.² B25B *5/00, 27/00*
U.S. Cl. 81—3 R **1 Claim**

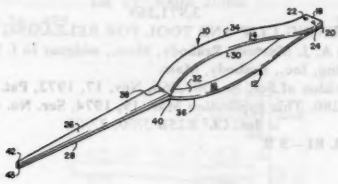


1. The combination of a fastening clip and a separate tool for releasing the same comprising:
a. a generally cylindrical housing having means forming a tapered conical surface at one end thereof,
b. a retainer of ferromagnetic material loosely received within said housing, said retainer being formed with a conical end adapted to mate with said tapered conical surface, an axial bore adapted to receive a pin or the like to be releasably retained by the clip, and at least one transverse opening formed in said conical end of relatively greater dimension than said axial opening,
c. a plurality of retaining balls disposed within said transverse opening between said tapered conical surface and said axial bore,
d. means for resiliently biasing said retainer toward the end of said housing formed with said tapered conical surface thereby adapting said balls to tightly frictionally engage said pin and retain the same in said housing, and
e. a tool separate from and independent of said housing for releasing said retaining balls, said tool including an electromagnet having an air gap, and means for creating a magnetic field at said air gap for attracting said retainer when said tool is positioned adjacent said housing, with movement of said retainer freeing said balls and permitting withdrawal of said pin, said means for creating a magnetic field comprising a rectifier bridge and windings around one leg of said electromagnet and electrically connected to said rectifier bridge, and an alternating current source for supplying alternating current to said rectifier bridge.

3,971,270
TWEEZERS

Joseph T. Wallace, 4401 Juniper, Tempe, Ariz. 85282

Filed June 2, 1975, Ser. No. 582,595
Int. Cl.² B25B 9/02
U.S. Cl. 81—43 10 Claims

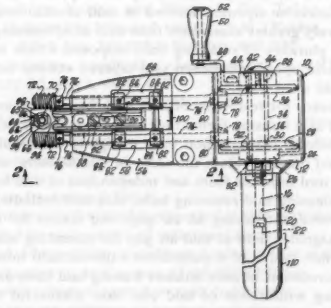


1. In a tweezer structure, the combination of: a pair of resilient tweezer members; each tweezer member having a handle portion provided with an integral finger portion; each handle portion having a butt end and said finger portion having a terminal end; said handle portion having a substantially concavo-convex portion integral therewith; said concavo-convex portion having a concave side and a convex side; said concavo-convex portion being integral with said finger portion; each finger portion having substantially straight configuration relative to said substantially concavo-convex portion; a transition portion disposed between said concavo-convex portion and said finger portion; said pair of tweezer members fixed together in resiliently loaded relation to each other at their butt ends; said concave sides facing each other; said transition portions being in close proximity to each other; said substantially straight finger portions being in resiliently loaded parallel contiguous relationship to each other; whereby opposed pressure on said convex sides of said concavo-convex portion causes said transition portions to engage each other and act as fulcrums and whereby said opposed pressure deflects said concave sides toward each other and pivots said finger portions apart at their terminal ends and beyond said transition portions.

3,971,271
WRENCH FOR SURGICAL USE

Frederick William Wagner, Jr., 1650 Amate Drive, Whittier, Calif. 90603, and Thomas A. Rickard, 46 Windjammer Court, Long Beach, Calif. 90803

Filed Aug. 25, 1975, Ser. No. 607,666
Int. Cl.² B25B 17/00
U.S. Cl. 81—57.29 7 Claims

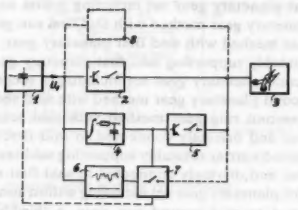


1. A wrench for surgical use, comprising:
a hollow housing;
an extension at one side of the housing;
said extension having a pair of shaft receiving parallel bores extending from the free end of the extension into the housing and spaced apart;
a pair of projections extending forwardly from the free end of the extension and spaced apart, there being aligned cross bores adjacent the ends of said projections and slots extending inwardly from the free ends of the parts into the respective cross bores, said slots being of less width than said cross bores, a socket rotatably disposed in said aligned bores, said socket having a nut receiving socket opening therein extending from one end of the socket to the other and having sides adapted to engage corresponding sides of nuts, said socket have a slot therein through which a nut is adapted to pass;
a worm wheel on the exterior of the socket and received in the space between the projections;
a pair of shafts rotatably disposed in the respective parallel bores in the extension;
a worm gear at the end of each of said shafts, said worm gears being at opposite sides of the worm wheel and operably engaging same;
gears within the housing secured to the respective shafts adjacent at inner ends, said gears being spaced apart;
a pair of interconnected gears within the housing engageable with the respective gears on the shafts;
means for operably rotating said interconnected gears;
a retaining member at each side of said extension and having a notch in the free end thereof, said retaining members being slidable between position whereat parts thereof at each side of the notch overlap the opening in the socket to prevent a nut in said socket from escaping laterally of the tool and a position whereat said retaining members are at an inoperative position.

3,971,272
REGULATION OF ELECTRONICALLY OPERATED QUALITY CONTROL EQUIPMENT

Ernst Felix, and Hans Locher, both of Uster, Switzerland, assignors to Zellweger, Ltd., Uster, Switzerland

Continuation of Ser. No. 118,100, Feb. 23, 1971, abandoned, which is a continuation of Ser. No. 400,340, Sept. 30, 1964, abandoned. This application July 8, 1974, Ser. No. 486,600
Claims priority, application Switzerland, Oct. 1, 1963, 12138/63
Int. Cl.² B26D 5/12, 5/38
U.S. Cl. 83—13 5 Claims



1. A method for regulating the operation of yarn clearers having error correcting means such as yarn cutters, and sensing means providing an electrical signal representative of the controlled quality, said method comprising the steps of: feeding the signal from the sensing means to two independent electrical circuit channels each having separate threshold switch means, the threshold switch means of one circuit responsive to signals corresponding to yarn faults of given magnitude, the threshold switch means of the other circuit responding to signals corresponding to faults of given duration; and obtaining an independent control signal from each of said channels for initiating the operation of the cutters when a

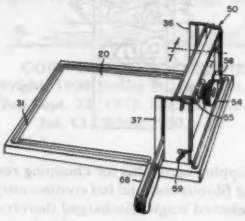
limiting value selected for each of said two channels is exceeded.

3,971,273

MEAT SLICING BOARD

Leo Peters, Grand Rapids, Mich.; Joseph M. Dymit, Addison, Ill.; James C. Lilley, Ada, Mich.; Donald R. Smith, and Henry Warners, both of Grand Rapids, Mich., assignors to Leo Peters, Grand Rapids, Mich.

Filed Feb. 26, 1975, Ser. No. 553,247
Int. Cl.² B26D 4/42, 4/46
U.S. Cl. 83—42 11 Claims



11. A method of hand slicing a boneless meat roast comprising the steps of:

a. placing the roast on a flat board,

b. positioning it between two upright posts extending from the board, the posts having aligned vertically extending knife guide-rail slots,

c. maintaining the posts rigidly in perfect alignment, thereby guaranteeing that slices cut from the meat are never cut on a bias to the length of the meat roast but always at a 90° angle to the length and thus, in turn, assuring that said slices are always of substantially equal thicknesses at their two opposite side edges,

d. pressing and holding one end of the meat against a vertically standing stationary back-up plate adapted for indexing movements to produce the various thicknesses of meat slices required for portion-weight control slicing of the meat,

e. spacing the plate at a distance from the slots equal to the desired thickness of a slice of meat,

f. slicing said slice-thickness-spaced meat-end by moving a knife downwardly within the slots and through the meat while the slots are guiding the knife's line of cut at right angles to the squared length and width of the meat roast, thereby producing a slice that is of uniform pre-determined, even thickness without dependence on human hands or eyes,

g. holding the completed slice flat and erect on a base-flange of the plate and between the uncut portion of the meat and the plate,

h. pivoting the plate and the flange-held slice downwardly to a generally horizontal plane, and then

i. transferring the slice with a sliding movement from the plate to a serving dish.

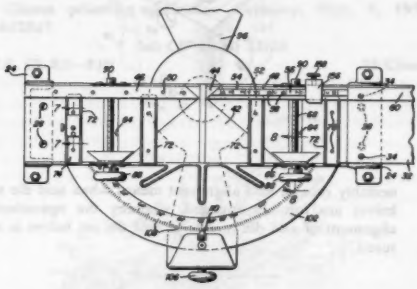
3,971,274

VARIABLE ANGLE CUT-OFF SAW

Glenn B. Barton, P.O. Box 127, Calhoun City, Miss. 38916

Filed Apr. 15, 1975, Ser. No. 568,186
Int. Cl.² B26B 11/10
U.S. Cl. 83—100 5 Claims

1. In combination, an elongated horizontal workpiece support, an elongated lower support arm extending transversely beneath said workpiece support centrally intermediate its opposite ends and with the central portion of said support arm oscillatably supported from said workpiece support for swinging of said support arm about an upright axis relative to said workpiece support, one end of said support arm including an upright standard supported therefrom projecting upwardly above said workpiece support, an upper support arm secured at one end from the upper end portion of said standard and extending over said workpiece support and generally paralleling said lower support arm, a depending mount slidably mounted on said upper support arm for guided movement therealong and a powered rotary saw blade journaled from a lower portion of said mount and disposed in an upright plane containing said upper support arm, the longitudinal side of said elongated workpiece support adjacent said standard including upwardly projecting abutment means extending along said workpiece support and adapted to have the adjacent side of a workpiece supported on said workpiece support and extending therealong abutted thereagainst, said elongated workpiece support including a longitudinal central portion



adapted to be traversed by said saw blade, the longitudinal side of said workpiece support remote from said standard including upwardly projecting abutment members spaced along said workpiece support on opposite sides of said central portion screw threadedly mounted from said workpiece support for independent adjustment transversely of the latter toward and away from said abutment means, longitudinally spaced portions of said elongated workpiece support including upright support means spaced along said workpiece support and supported therefrom on opposite sides of said central portion for independent adjustable transverse shifting relative to said workpiece support member, releasably securable in adjusted positions and having workpiece hold-down members mounted thereon for independent adjustable vertical shifting therealong, and means operative to releasably secure said hold-down members in adjusted vertically shifted positions.

3,971,275

NESTABLE DIE ALIGNMENT MEANS FOR PUNCH PRESS MACHINES

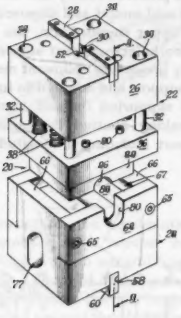
John J. Mach, 2126 S. Kenilworth Ave., Berwyn, Ill. 60402

Filed Sept. 18, 1975, Ser. No. 614,705
Int. Cl.² B26F 1/14
U.S. Cl. 83—140 3 Claims

1. Alignment apparatus for punch press machines of the type having separable die set halves, a first die set half being affixed for reciprocal operative movement with the punch press ram and a second die set half being affixed to the press bed, each die set half comprising die carrier block means and demountable die insert means, the latter cooperatively operable to position a workpiece during punching thereof, punch means, and workpiece stripper means, the alignment apparatus comprising in combination:

projecting die insert means secured to one die set half and extending therefrom toward the other die set half, said projecting die insert means presenting alignment means formed on the outer periphery thereof; nesting means carried by the die carrier block means of the other die set

half and formed about the die insert means thereof, said nesting means extending toward said projecting die insert means of said one die set, thereby providing a nesting recess characterized by an inner periphery operable to



nestably receive said alignment means when said die set halves are forcibly engaged, whereby the operational alignment of said die inserts of said die set halves is assured.

3,971,276

PICTURE COMPOSING TECHNIQUES AND APPARATUS THEREFOR

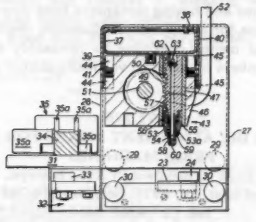
Leonard Kay Billows, 1 Longdean Park, Hemel Hempstead, Hertfordshire, England

Filed Aug. 6, 1973, Ser. No. 385,638

Claims priority, application United Kingdom, Aug. 9, 1972, 37178/72

Int. Cl.² B26D 7/18

U.S. Cl. 83—164 5 Claims



1. A montage or "light" table comprising a structure movable along the table, a punch mechanism including a hollow cutting punch mounted upon the structure for movement relatively thereto across the table, a core member within the hollow punch and movable relatively thereto to eject punched-out discs within the hollow punch, means for reciprocating the hollow cutting punch to effect a punching operation by cutting, a receptacle for discs and further means for moving the receptacle between a first position, beneath the hollow punch to receive discs ejected from the hollow punch by the core member, and a second position clear of the path of reciprocation of the hollow punch.

3,971,277

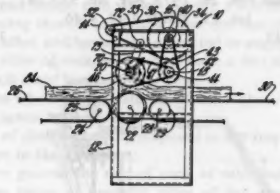
INTERMITTENTLY OPERABLE ROTARY CHOPPING APPARATUS FOR MATTED FIBROUS MATERIAL

Carl D. Kowalski; Lawrence R. Finn, both of Toledo, and Richard C. Yawberg, Grand Rapids, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed June 19, 1975, Ser. No. 588,525

Int. Cl.² B26D 7/14, 1/56

U.S. Cl. 83—176 7 Claims



1. Rotary chopping apparatus for chopping resiliently compressible matted fibrous material fed continuously thereto into mats of a pre-selected length discharged therefrom, the apparatus comprising a back-up roll, a rotatably mounted chopping blade intermittently driven while the apparatus is in operation and cooperatively associated with the back-up roll, means for rotatably driving the chopping blade from a rest position through one revolution upon the passing of substantially a pre-selected length of the matted fibrous material across the back-up roll, means for stopping the chopping blade in its rest position after the one revolution until additional matted fibrous material of a length substantially equal to the pre-selected length has passed the back-up roll, and a cam associated with the chopping blade and mounted rotationally ahead thereof for progressively compressing the matted fibrous material against the back-up roll, by moving a top surface of the material progressively closer to the back-up roll before the chopping thereof by the cooperative action of the chopping blade and the back-up roll, to aid in effecting end surfaces on the chopped-off mats substantially planar and substantially perpendicular to top and bottom surfaces of the mats after end portions thereof resume their original thickness from a compressed state occurring during the chopping.

3,971,278

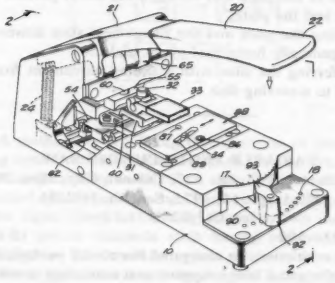
CARRIAGE POSITIONING MECHANISM

Horst W. Wich, 816 Brent St., South Pasadena, Calif. 91030

Division of Ser. No. 458,708, April 8, 1974. This application June 30, 1975, Ser. No. 591,639

Int. Cl.² B26F 1/12

U.S. Cl. 83—413 11 Claims



1. In a key cutting machine, punch and die mechanism comprising:

a die carriage having a die and a punch supported thereon, said punch being reciprocable within said die;

guideway means supporting said die carriage for movement in a direction perpendicular to the axis of reciprocation of said punch, said die carriage having a series of notches spaced along one surface thereof in a direction parallel to said guideway means;

ratchet means adapted to engage a selected one of said notches for supporting said carriage in a corresponding position of movement; and

drive spring means associated with said die carriage for advancing same through a series of positions corresponding to respective ones of said carriage notches.

3,971,279

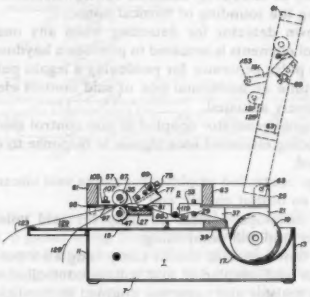
COPY TRIMMER MACHINE

William T. Wright, 1800 Stokes St., San Jose, Calif. 95126

Filed Sept. 22, 1975. Ser. No. 615,477

Int. Cl.² B26D *7/00*, *1/02*

U.S. Cl. 83—425.4 8 Claims



1. A copy trimmer machine comprising a base frame having means for supporting a roll of paper to be trimmed, a guide assembly supported on said base frame and including means for guiding paper from such roll past a trimming location, a cutter assembly, means removably securing said cutter assembly to said guide assembly, said cutter assembly including meaps for trimming said paper as it passes said trimming location.

3,971,280

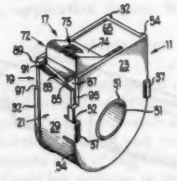
TAPE DISPENSER

Egons Inka, Chicago, Ill., assignor to Crane Packing Company, Morton Grove, Ill.

Filed Nov. 6, 1975, Ser. No. 629,271

Int. Cl.² B26D *1/38*, *5/10*

U.S. Cl. 83—436 10 Claims



1. A dispenser for shearable material comprising:

a chamber defining housing for receiving a quantity of material in the form of a rolled strip, said housing including means defining an opening to allow egress of the material from the chamber;

advancement means operable to advance the strip of material out of said chamber through the opening; and

a shearing mechanism integrally formed on said housing said shearing mechanism including a pair of sharp shearing edge surfaces disposed to receive the strip material therebetween and being movable to produce point contact between said sharp shearing edge surfaces progressively thereacross to effect shearing of the interposed strip of material.

3,971,281

ANGLE SHEARS WITH DIVIDED SHEAR CUTTING MEMBERS

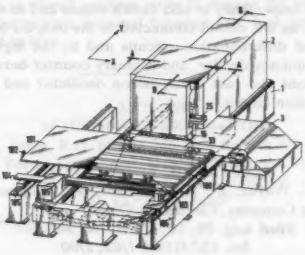
Walter Bredow, Ziegelmasch 16a; Walter Tamaschke, Pestalozzistr. 10, both of 322 Alfeld, Leine, and Günther Rott, Neue Strasse 35, 3221 Gerzen near Alfeld, all of Germany

Filed Feb. 11, 1975, Ser. No. 549,055

Claims priority, application Germany, Sept. 5, 1974, 2442547

Int. Cl.² B23D *15/08*

U.S. Cl. 83—519 15 Claims



1. An angle shears for cutting sheet metal and the like including two shear cutting members for cuts in two directions, the shear cutting members having cutting edges, means arranging one shear cutting member in the X-direction and the other shear cutting member in the Y-direction to be capable of moving independently of each other, the cutting edges of the shear cutting members being inclined at small angles to the surface of the sheet metal to be cut, a divided drive for said shear cutting members including threaded spindles operably connected to the shear cutting members whereby rotation of the spindles in one direction moves the shear members in a first direction and rotation of the spindles in a second direction moves the shear members in the opposite direction, and a positional sensor for sensing the vertical position of the shear cutting members.

3,971,282

ELECTRONIC MUSICAL INSTRUMENT CAPABLE OF TRANSPOSITION

Nobuharu Obayashi, Shizuoka, and Tetsuzi Sakashita, Hamamatsu, both of Japan, assignors to Kabushiki Kaisha Kawai Gakki Seisakusho, Hamamatsu, Japan

Continuation-in-part of Ser. No. 352,627, April 19, 1973, Pat. No. 3,877,337. This application Jan. 27, 1975, Ser. No. 544,664

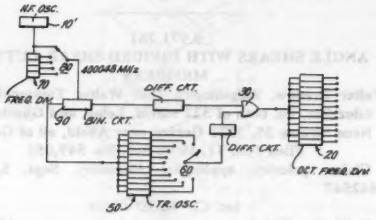
Claims priority, application Japan, Apr. 20, 1972, 47-39103

Int. Cl.² G10H *1/00*, *5/02*

U.S. Cl. 84—1.01 1 Claim

1. An electronic musical instrument capable of transposition comprising a high frequency oscillator having an output, a first frequency divider connected to the output of said oscillator, selector switch means connected for selecting the output frequency of the high frequency oscillator or a divided frequency at different outputs of the divider, an octave frequency divider including twelve counter circuits to generate

twelve tone signals, a transposition oscillator including a plurality of counter circuits, means to control the addition of the frequency of the output of said high frequency oscillator or said first frequency divider to the frequency of the output of the transposition oscillator to generate an input frequency for the octave frequency divider, said means including a selector switch between the transposition oscillator and said octave



frequency divider, first and second differentiation circuits connected respectively to said switch means and to said selector switch, an OR circuit connected to the outputs of the first and second differentiation circuits and to the input of the octave frequency divider, and a binary counter between said switch means and said transposition oscillator and said first differentiation circuit.

3,971,283

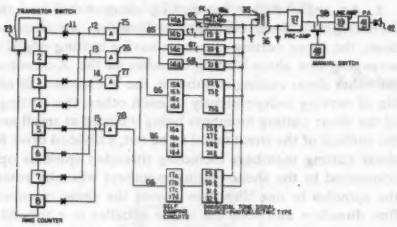
ELECTRONIC ZIMBELSTERN

William C. Wayne, Jr., Fort Mitchell, Ky., assignor to D. H. Baldwin Company, Cincinnati, Ohio

Filed Aug. 29, 1974, Ser. No. 501,847

Int. Cl.² G10H *1/02, 5/00*

U.S. Cl. 84—1.26 **8 Claims**



1. In combination, with a plurality of groups of tone signal sources, said tone signal sources being normally inoperative and operative in response to application of control voltages for rendering said tone signal sources operative at amplitudes which are functions of the levels of said control voltages, a source of repetitive relatively short pulses, a plurality of leads connected to said sources and each conveying one of said pulses, means for converting said relatively short pulses to plural relatively long control voltage pulses, each of said relatively long control voltage pulses having a predetermined relatively rapid exponential rate of rise followed by a relatively slow exponential rate of fall, each of said groups of tone sources including plural sinusoidal tone sources having frequencies appropriate in combination to form partials of a bell sound, when electroacoustically reproduced, and means applying said plural relatively long control voltage pulses as said control voltages individually to said tone signal sources, the said rates of rise and fall of each of said control voltages, respectively, being appropriate to shape the envelopes of said tone signal sources, respectively, of said groups appropriately to simulate the sounds of a different bell for each of said groups.

3,971,284

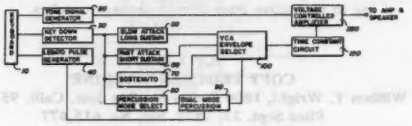
PLURAL MODE ENVELOPE GENERATOR FOR VOLTAGE CONTROLLED AMPLIFIER

Wilford R. Schreier, Bensenville, Ill., assignor to Hammond Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 447,905, March 4, 1974, Pat. No. 3,898,905. This application Mar. 3, 1975, Ser. No. 554,437

Int. Cl.² G10H *1/02, 5/02*

U.S. Cl. 84—1.26 **6 Claims**



1. In combination in an electronic musical instrument:
a plurality of selectively actuable control elements for controlling the sounding of musical notes;
a keydown detector for detecting when any one of said control elements is actuated to produce a keydown signal;
a legato pulse generator for producing a legato pulse signal each time an additional one of said control elements is effectively actuated;
a tone signal generator coupled to said control elements for producing electrical tone signals in response to actuation thereof;
a voltage controlled amplifier for gating said electrical tone signals to an output circuit; and
voltage envelope control circuitry for said voltage controlled amplifier comprising:
a basic time constant circuit comprising an input lead, an output lead coupled to said voltage controlled amplifier, and a resistor and capacitor coupled in parallel between said input and output leads and ground;
a plurality of envelope signal generating means coupled individually to one or both of said keydown detector and said legato pulse generator, each adapted to be operatively coupled to said input lead of said basic time constant circuit to produce a different envelope signal on said output lead thereof; and
selector circuit means for selectively coupling individual ones of said envelope signal generating means to said input lead.

3,971,285

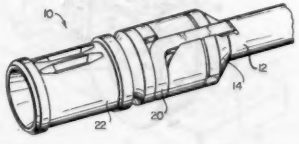
ADJUSTABLE MUZZLE COMPENSATOR

Paul H. Ellis, and Richard R. Kramer, both of Bel Air, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 31, 1975, Ser. No. 563,543

Int. Cl.² F41C *21/18*

U.S. Cl. 89—14 C **7 Claims**



1. A device to be mounted on a muzzle of a weapon comprising:
a collar means adapted to be secured to said muzzle having two indexing slots for defining two radial positions on said muzzle, said collar means including a plurality of internal

radial ridges for engaging said muzzle and preventing rotational movement of the collar relative to the muzzle;

gas diverter means adapted to be rotatably connected to the muzzle and to extend beyond the end of the muzzle for diverting gases exiting said muzzle to a preselected radial direction; and

locking means interconnecting said collar means and said gas diverter means for locking said gas diverter means in one of the two radial positions defined by said collar means.

3,971,286

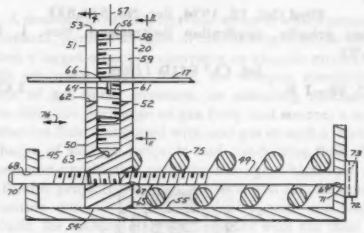
GUITAR STRING SUPPORTING DEVICE

James J. Borell, 1318 W. Oak St., Kissimmee, Fla. 32741

Filed Aug. 27, 1975, Ser. No. 608,063

Int. Cl.² G10D 3/04

U.S. Cl. 84—298 10 Claims



1. A guitar comprising an elongated horizontally arranged keyboard, a guitar string suspended over the keyboard, and a device mounted at one end of the keyboard for thereat supporting said guitar string above the keyboard, said device comprising a body portion having vertically spaced apart upper and lower faces, horizontally spaced apart opposite side walls located between said faces, an axially vertically arranged threaded bore located between said side walls and opening upwardly through the upper face of the body portion, and a vertical slot which lies in a plane common to the axis of said bore and which opens laterally of the body portion through said side walls and upwardly through said upper face, and a threaded screw element which threadedly engages the body portion within said bore and has an upper surface that is located below said upper face; said guitar string being received in said slot and supported on said upper surface, and said screw element being axially adjustable in the bore by the rotatable manipulation thereof with respect to the body portion.

3,971,287

DAMPER FOR STRING INSTRUMENT

Tetsuo Ito, 5-5-22, Shimo-Hoya, Hoya, Tokyo, Japan

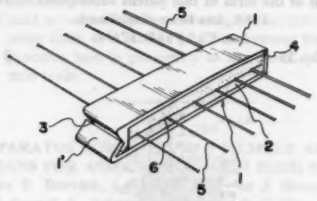
Filed Sept. 9, 1974, Ser. No. 504,238

Claims priority, application Japan, Nov. 26, 1973, 48-135760[U]

Int. Cl.² G10D 3/00

U.S. Cl. 84—453 11 Claims

1. A damper for a stringed instrument comprising a clamp formed of an integral elongate strip of plastic material comprising two leg portions of approximately equal length, a short intermediate connecting portion and transversely notched portions joining opposite ends of said connecting portion with one end of each of said leg portions in hinge lines, the other ends of said leg portions being free, and catch means at said free ends of said leg portions for releasably securing said free ends together, said legs being movable by flexing of said strip at said hinge lines between a closed position in which said catch means is engaged and said legs are approximately parallel to one another and an open position in which said catch means is disengaged and said legs are disposed angularly to one another and a strip of plastic sponge material on the inner faces of said legs, said plastic sponge material being of a thickness equal to approximately half the distance between said legs when in closed position so as to engage the strings of a stringed instrument disposed between said legs and thereby damp said strings.



3,971,288

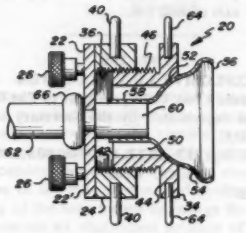
MOUTHPIECE EXTRACTOR

Robert C. Jones, R.D. 6, Box 275, and Robert W. Anderson, R.D. 6, Forest View Acres, both of Flemington, N.J. 08822

Filed Dec. 8, 1975, Ser. No. 638,319

Int. Cl.² G10D 9/02

U.S. Cl. 84—453 11 Claims



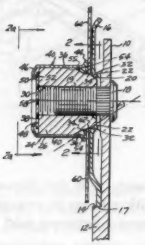
1. Apparatus for removing the mouthpiece from a musical instrument comprising, in combination: clamping means having a central opening therethrough for engaging the tubular portion of said instrument adjacent an enlargement on the tubular portion; a support collar having an annular threaded interior portion and a radially extending opening communicating with said threaded interior surface of said collar to receive the tubular portion of said instrument therethrough; means for removably coupling said clamping means to said collar; and hollow ring means coaxially aligned with said support collar and having a first end, a second end, an annular threaded exterior portion adjacent said first end, said threaded exterior portion being rotatably engaged with said threaded interior portion of said collar, and a radially extending opening communicating with the interior of said ring means to receive the tubular portion of said instrument therethrough, said ring means second end being adapted to abut said mouthpiece to exert a longitudinal thrust thereon to separate said mouthpiece from the tubular portion of said instrument as said ring means and said support collar are rotated in opposite directions relative to one another so as to cause said ring means to move longitudinally away from said clamping means.

3,971,289

WHEEL NUTS

Joseph W. Chaivre, Royal Oak, Mich., assignor to Towne Robinson Fastener Company, Dearborn, Mich.

Continuation of Ser. No. 69,816, Sept. 4, 1970, abandoned, which is a division of Ser. No. 825,330, May 16, 1969, Pat. No. 3,561,820. This application July 24, 1972, Ser. No. 274,364
The portion of the term of this patent subsequent to June 22, 1988, has been disclaimed.
Int. Cl.² F16B 37/14
U.S. Cl. 85—35 3 Claims



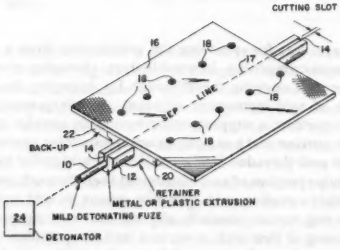
1. A capped wheel nut assembly comprising: a wheel nut having a plurality of flat peripheral faces and an axially extending shank portion of reduced diameter, a decorative cap of relatively thin sheet material having a skirt portion overlying the faces of the nut and in facial engagement therewith, said skirt portion terminating adjacent said shank in a radially outwardly extending flared flange of greater diameter than said skirt portion which is in facial engagement with said nut, said flared flange being reversely bent substantially radially inwardly toward said shank portion to provide a flat, annular surface having a plane which is substantially perpendicular to the longitudinal axis of said nut.

3,971,290

EXPLOSIVE LINEAR CUTTER

Jim W. Blain, Santa Cruz, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 13, 1974, Ser. No. 505,696
Int. Cl.² B26F 1/26
U.S. Cl. 89—1 B 2 Claims



1. Apparatus for making a clean cut in a composite laminate of graphite/fiberglass material comprising:

cutter means for propelling a high velocity metal fragment into the material to be cut, said cutter means comprising:

an explosive longitudinal core sheathed in a metal covering, said core and said covering having a circular cross section, said covering being adapted to fragment upon firing of said core;

a support extending in a longitudinal direction and having an elongate bore of circular cross section in intimate contact with the core metal cover to encompass it over more than one hundred and eighty degrees of its external surface;

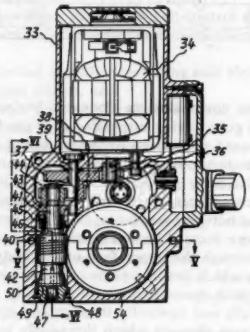
a narrow longitudinal slot with parallel walls having an internal width dimension that is no greater than the diameter of said bore, said slot extending from the bore and forming a spaced opening between a portion of the sheathed core and the material to be cut when the latter is placed upon the support over the slot for cutting by means of a highly directional jet formed from a portion of said sheath and by said slot geometry upon explosion of said core.

3,971,291

APPARATUS FOR COCKING A BREECHBLOCK

Heinz Schellenberg, Wetzikon, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG, Zurich, Switzerland

Filed Oct. 15, 1974, Ser. No. 514,833
Claims priority, application Switzerland, Nov. 1, 1973, 15396/73
Int. Cl.² F41D 11/00
U.S. Cl. 89—1 K 2 Claims



1. An apparatus for cocking a breechblock of an automatic firing weapon comprising, in combination:

A. an electric motor;

B. a displacement mechanism for the breechblock for moving the breechblock into its cocked position;

C. an electromagnetic coupling for connecting said electric motor with said displacement mechanism;

D. transmission means arranged between the electric motor and the electromagnetic coupling;

a. said transmission means forming an overload device including:

1. a worm;

2. a worm gear meshing with said worm;

3. a spring cooperating with said worm;

E. means for mounting said worm to be axially displaceable against the force of said spring;

F. a conical portion provided for the worm;

G. an electric switch for disconnecting the electromagnetic coupling when the breechblock reaches its cocked position;

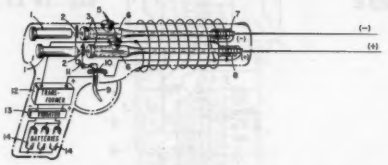
H. said conical portion actuating said electric switch during axial displacement of the worm for disconnecting the electromagnetic coupling upon encountering a displacement resistance of the breechblock which exceeds a predetermined value.

3,971,292

PROJECTOR OF FLUID WITH ELECTRIC CHARGE, OF PORTABLE TYPE

Juan Garcia Paniagua, C/Alejandrina, 1609, Guadalajara, Jal., Mexico

Filed Nov. 12, 1974, Ser. No. 522,775
Int. Cl.² F41F 5/00
U.S. Cl. 89—1 A 8 Claims



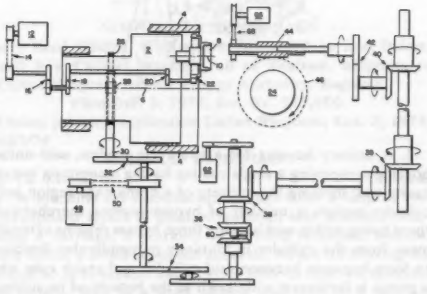
1. A double-barrelled electrical weapon which projects two, continuous, parallel streams of conducting medium and which utilizes a target object to complete an electric circuit through which electrical energy flows, the weapon consisting of: a source of gas under pressure; an actuating mechanism for controlling the discharge of gas from said source; a source of conductive fluid associated with said gas in such a manner that discharge of said gas projects said conductive fluid; first and second non-conductive conduits through which said conductive fluid is projected by said gas; first and second conductive contactors associated with respective said non-conductive conduits, for making electrical contact with the fluid passing through said first and second conduits; an electrical power supply whose poles are connected to respective said first and second contactors so that the conductive fluid propelled from one of said conduits is electrically positive, and the conductive fluid propelled from the other of said conduits is electrically negative; and first and second solenoids, concentric with respective of said non-conductive conduits for reinforcing the polarity and intensity of the electrical energy in said conductive fluid.

3,971,293

ANTI-BACKLASH MECHANISM FOR GENERATING TRAIN OF GEAR CUTTING MACHINE

Ernst J. Hunkeler, Fairport, N.Y., assignor to The Gleason Works, Rochester, N.Y.

Filed Apr. 30, 1975, Ser. No. 572,998
Int. Cl.² B23F 9/10
U.S. Cl. 90—5 5 Claims



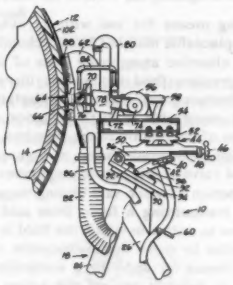
1. In a gear generator having
a. a rotatable work-holding spindle,
b. a cutter spindle mounted in a rotatable cradle,
c. a generating train interconnecting the work spindle and cradle for rotating them simultaneously in timed relation, and
d. first drive means,
i. connected to the generating train at a first junction intermediate said work spindle and cradle,
ii. for driving said train in at least one direction,
the improvement comprising:
e. second drive means
i. for simultaneously driving the train in the same said direction,
ii. said second drive means being connected to the generating train at a second junction remote from said first junction and in proximity to the work spindle end of said train.

3,971,294

APPARATUS FOR CUTTING A MEMBER AND SEAL MEANS FOR ASSOCIATION WITH SUCH MEMBER

Charles E. Devrick, Lakeland; Nicholas J. Houmis, Tampa, and Russell A. Johnson, Brandon, all of Fla., assignors to Fibreboard Corporation, San Francisco, Calif.

Filed Feb. 11, 1974, Ser. No. 441,060
Int. Cl.² B23C 1/14
U.S. Cl. 90—20 2 Claims



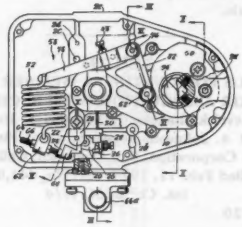
1. Apparatus for forming an annular groove about the outer surface of a member rotatable about an axis, comprising:
base means; means adjustably positioning said base means;
cutter means comprising a rotatable cutter having a plurality of cutting edges, means rotatably mounting said cutter relative to the base means, and positionable upon positioning of the base means to engage the outer surface of the member so, that, upon rotation of said cutter, said cutting edges are in cutting engagement with the outer surface of said member; said adjustable means further including means for selectively varying the position of the cutter relative to the base means and the member toward and away from said axis about which the member is rotatable and means for selectively varying the position of the cutter relative to the base means and the member generally along said axis about which the member is rotatable,
means for rotating the cutter to cut the outer surface of the member, so that upon said rotation of the member about said axis, said annular groove is cut therein about the outer surface thereof,
said means for rotating the cutter comprising an air motor means drivable upon a supply of flowing air thereto, and further comprising inlet conduit means for supplying a flow of air exhausted from said air motor means adjacent to the cutter, and outlet conduit means conducting the air with the member material residue resulting from said cutting of the member away from said cutter, and
brush means mounted relative to the base means and disposed around the cutter and engageable with at least a portion of the outer surface of the member adjacent the cutter serving to contain the air entering and exiting adjacent the cutter means.

3,971,295

CONTROL MEANS

Alan Richard Brine Nash, 39 Abbott's Ride, Farnham, England

Filed Sept. 11, 1974, Ser. No. 505,132
Claims priority, application United Kingdom, Sept. 14, 1973, 43297/73
Int. Cl.² F15B 13/16
U.S. Cl. 91—386 9 Claims



1. Positioning means for use with an actuator having a chamber, a displaceable member in said chamber and porting leading to the chamber at opposite sides of the member for admission of pressure fluid to displace the member in the chamber, an element connected to and displaceable with said member being engageable from the exterior of the actuator for transmission of the motion of the member, the positioning means comprising, in combination, a control valve, means connecting said valve to said actuator chamber, biasing means and interconnection between said biasing means and the control valve for transmitting a force from said biasing means urging the valve to a state in which the fluid is supplied to the actuator chamber to move the displaceable member to one end position, means for applying a controlling force to the control valve to move it against the action of the biasing means, feedback means comprising an element connected to said transmission element of the actuator for movement by said element and said feedback means further comprising a lever, pivot means supporting the lever intermediate its extent, opposite end portions of the lever projecting in different directions from said pivot means, one end portion of the lever engaging said element of the feedback means, the other end portion being connected to a first region of the biasing means for modifying the action of the biasing means on the control valve in dependence upon the movement of said transmission element, whereby the control valve is brought to a neutral position by the resultant action of said feedback and biasing means with said controlling force means, said neutral position being obtained at an actuator position dependent upon the magnitude of said controlling force, the control valve being disposed between the biasing means and said element of the feedback means, and the feedback means lever being adjacent one side of the control valve, said interconnection means being connected to a region of the biasing means remote from said first region and being adjacent to the opposite side of the control valve.

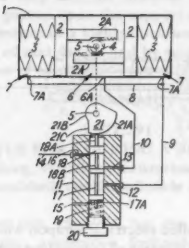
3,971,296

PNEUMATIC ACTUATORS

John Tugwell, Crawley, England, assignor to Kelor Limited, Burgess Hill, England

Filed Sept. 18, 1974, Ser. No. 507,105
Int. Cl.² F01B 7/06; F15B 13/042
U.S. Cl. 91—392 3 Claims

1. A pneumatic actuator comprising:
a housing;
a double acting piston movably disposed in said housing separating two pressure chambers;
spring means for urging said piston in one direction;
valve means for admitting compressed air to one of said chambers for loading said spring means, and for transferring some of the air from said one chamber into the other chamber to be trapped therein when the supply of compressed air is cut off, and for opening said one chamber



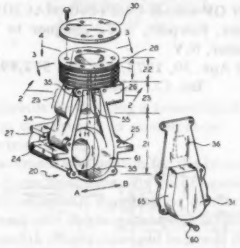
to atmosphere, said spring means and the trapped compressed air providing combined forces acting on said piston in said other chamber completing a power stroke of the actuator; and
means for mechanically interconnecting said piston with said valve means for opening said one chamber to atmosphere at a selected phase position of said piston.

3,971,297

TWO CYCLE ENGINE WITH PERIPHERAL BYPASS FOR PISTON HEAD AND METHOD OF MANUFACTURE

Duke M. Fox, Fort Smith, Ark., assignor to Fox Manufacturing Company, Fort Smith, Ark.

Filed May 24, 1974, Ser. No. 473,074
Int. Cl.² F16J 11/02
U.S. Cl. 92—169 6 Claims



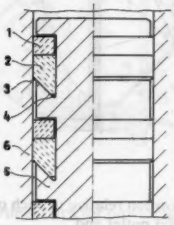
1. A unitary housing for a two-cycle engine, said unitary housing comprising a single casting having a common internal cavity wall forming the entirety of a crank case region and a cylinder region, a number of bypass regions therebetween, there being within said housing three bypass regions extending away from the cylinder in mutually perpendicular directions to form bypasses between said cylinder and crank case when a piston is furtherest withdrawn at the bottom of its stroke, a shaft bearing support region in the crank case and at the front of the housing, an opening formed in the back of the cavity wall of said housing, said opening beginning below the shaft bearing support region and extending from the crank case region through said bypass region, and removable cover means having at least part of one of said bypass cavities formed therein for covering said opening.

3,971,298

PISTON ASSEMBLY WITH COMPRESSION AND GUIDING RINGS

Stanislaw Kulig, Krakow, Poland, assignor to Oswdek Badawczo-Rozwojowy Przemyslu Budowy Chemicznych Cebea, Krakow, Poland

Filed May 7, 1974, Ser. No. 467,838
Claims priority, application Poland, May 10, 1973, 162453
Int. Cl.² F16J 1/00, 9/20
U.S. Cl. 92—248 3 Claims



1. A piston assembly adapted for use in non-lubricated high-pressure compressors, comprising a piston having a plurality of identical peripheral trapezoidally shaped cross-section grooves therein with each groove having a uniform annular base, a dual ring assembly in each groove protruding from said piston surface so as to contact the cylinder walls of said compressors, thus avoiding direct contact of the piston with said cylinder walls consisting of a seal ring of rectangular-shaped cross-section and a guide ring of largely trapezoidal cross-section with said guide ring seated behind the seal ring in a direction away from the compression end, said seal ring and guide ring in each groove having abutting planar surfaces, said guide ring having a surface opposite the one abutting with the seal ring which is at an acute angle relative to the base thereof to form the said trapezoidal cross-section and at least partially conical in shape, each peripheral groove in said piston having a corresponding wall defining an acute angle with the base of the groove to define an angularly shaped groove enabling said guide ring to hook into same and in abutment therewith, said guide ring being made from carbon-graphite material providing higher resistance to shape deformation than the seal ring said seal ring being made from polytetrafluoroethyle and both rings being more abradable than the material of the piston.

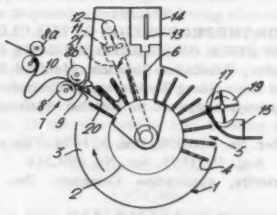
3,971,299

MANUFACTURE OF BAGS

Harry Reed Whittle, Wallingford; Michael John Lee, Didcot, and Roy Causer, Wantage, all of England, assignors to United Kingdom Atomic Energy Authority, England

Filed Dec. 3, 1974, Ser. No. 529,056
Claims priority, application United Kingdom, Oct. 3, 1974, 43027/74
Int. Cl.² B31B 23/00
U.S. Cl. 93—33 H 21 Claims

1. A machine for manufacturing bags from a strip of two superimposed layers of plastics material, said machine comprising a carriage, a plurality of dividing members thereon which define a series of spatial intervals, means for moving the carriage so as to present each spatial interval first to a material feed station, then to a work station, and then to a take-off device, said feed station including means for continuously feeding a strip of material to the carriage, means for maintaining a predetermined relationship between the rate of feed of the material and the speed of the carriage, and a feed duct for feeding the strip of material into each spatial interval as that spatial interval is presented to the feed station, the work station including means for forming a welded seam and for cutting the strip material into sealed length at every alternate dividing member as it is presented to the work station, and said take-off device comprising at least one stationary spike pointing in a direction opposite of the direction of movement of the dividing members past the take-off device and disposed



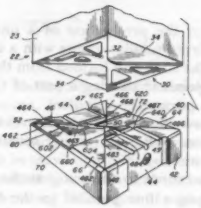
so as to pierce the sealed and cut lengths of material where said lengths are folded over the dividing members intermediate the dividing members at which the cutting and sealing operations are carried out, the said intermediate dividing members being relieved to allow the passage of the at least one spike therethrough.

3,971,300

APPARATUS FOR ULTRASONIC SEALING OF NON-UNIFORM FOLDED CARTON BOTTOM CLOSURE

George L. Bachner, Barrington, Ill., assignor to Nimco Corporation, Crystal Lake, Ill.

Filed Apr. 25, 1975, Ser. No. 570,544
Int. Cl.² B31B 1/28
U.S. Cl. 93—36.3 31 Claims



1. Apparatus for use with a bottom closure folding machine for sealing the bottoms of paperboard cartons composed of foldable thermoplastic double coated material, comprising:

a first means for sealing, said first sealing means having a body portion and a face with a raised portion and a recessed portion;

a second means for sealing, said second sealing means for forcibly engaging said first sealing means, said second sealing means having a multiplicity of surfaces separated from one another by walls, said multiplicity of surfaces lying in at least two distinct planes and shaped for receiving infolded panels of a folded carton bottom closure so that the force applied to the outer surface of the folded carton bottom closure during forcible engagement of said first sealing means and said second sealing means is substantially uniform over a selected area of the folded carton bottom closure;

an ultrasonic vibrator for creating ultrasonic vibration which is transmitted to said selected area of the folded carton bottom closure during a portion of the period of forcible engagement between said first sealing means and said second sealing means to create an ultrasonic seal over said selected area of the folded carton bottom closure; and

a drive means for urging said first sealing means and said second sealing means into forcible engagement during the sealing operation.

3,971,301

PROCESS FOR THE PRODUCTION OF THE CLOSURE OF A HOLLOW STICK OF SHIRRED SAUSAGE CASING

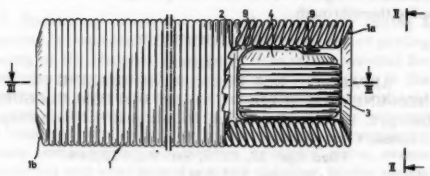
Reinhold Becker, Wiesbaden-Biebrich; Manfred Hennecken, Walluf, and Hans-Georg Zimmerman, Wiesbaden-Biebrich, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Division of Ser. No. 528,838, Dec. 2, 1974. This application Aug. 29, 1975, Ser. No. 609,316

Claims priority, application Germany, Dec. 3, 1973, 2360480

Int. Cl.² A22C *13/00*

U.S. Cl. 93—84 TW 1 Claim



1. A process for the production of a unilaterally closed hollow stick of shirred tubular casing with a closure arranged in the interior of the stick and formed from the tubular casing itself, which comprises unshirring a part of the stick to form an unshirred tube portion,

drawing a narrow stick ring from the stick so that an unshirred portion of tubular casing remains between the ring and the stick,

applying a radial force to the outer surface of the narrow stick ring along a line parallel to the longitudinal axis thereof and thereby compressing said ring to form a shaped body having two halves, which body serves as a closure

rotating the closure through 90° in a manner such that a dome-shaped end thereof points to the stick end from which the stick ring was drawn,

and pushing said closure into said stick end.

3,971,302

CHIMNEY FOR EXHAUST GAS HAVING AN ADJUSTABLE MEANS FOR THROTTLING A FLOW OF EXHAUST GAS

Hermann A. Durrer, Brutten, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

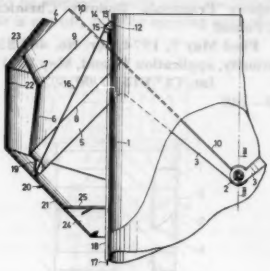
Filed Nov. 19, 1974, Ser. No. 525,178

Claims priority, application Switzerland, Nov. 23, 1973, 16508/73

Int. Cl.² B05B *15/04*

U.S. Cl. 98—60 11 Claims

1. An exhaust gas chimney having an outlet end and a throttling means at said end for throttling a flow of exhaust gas passing from said end, said throttling means including a pair of members movably mounted at said outlet end for movement between a closed position relative to each other to define an upwardly converging funnel-like nozzle above said outlet end for throttling a flow of gas passing from said outlet



end and an open position relative to each other and out of the vertical plane of said outlet end.

3,971,303

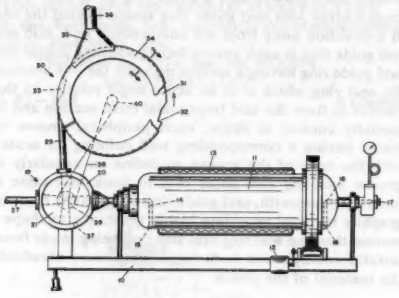
APPARATUS FOR CONTINUOUS PUFFING

Myrland J. Dahl, Northfield, Minn., assignor to Malt-o-Meal Company, Minneapolis, Minn.

Filed Feb. 24, 1975, Ser. No. 552,328

Int. Cl.² A23L *1/18*

U.S. Cl. 99—323.4 8 Claims

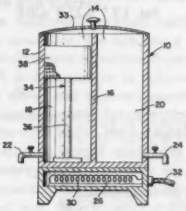


1. An apparatus for continuous puffing of food material capable of being puffed comprising a pressurized puffing chamber having at its ends, respectively, an inlet and an orifice which is open to a zone of lower pressure than that of the chamber, material supply means, valve means for directing into the inlet successive charges of material and a pressurized gaseous fluid comprising a valve member having at least one passageway extending therethrough, said valve member being movably mounted to repeatedly bring the passageway into and out of communication with said inlet and into and out of position to receive a charge of material from the supply means, feeding means for feeding a charge of material into the passageway each time it is in material receiving position, said feeding means including propelling means for receiving separate successive charges of material from the supply means and applying force thereto for forcibly propelling each charge into the passageway, and means for directing a stream of pressurize gaseous fluid into the passageway after it has received a charge of material and it is in communication with the inlet whereby the fluid and material are brought into mutual contact and then forced into the chamber and expelled through the orifice to cause puffing of the material.

3,971,304
DUAL COMPARTMENT BEVERAGE URN

Mary Cvitkovich, Bellerose, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Feb. 28, 1975, Ser. No. 554,074
Int. Cl.² A47J 31/00
U.S. Cl. 99—291 5 Claims



1. A dual compartment urn for providing heated beverages, comprising:

a. a generally cylindrical body defining an interior space;

b. a single continuous partition member disposed in said space and dividing said space into first and second compartments, said partition member and said generally cylindrical body comprising an integral structure whereby the respective contents of said compartments are confined thereto;

c. separate spout means on said generally cylindrical body and communicating with said first and second compartments, respectively;

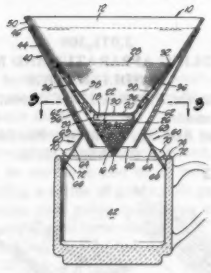
d. heating means disposed at said cylindrical body so as to be in heat transfer relationship with said respective contents of said first and second compartments; and

e. percolating means for holding coffee grounds and the like.

3,971,305
DISPOSABLE BEVERAGE BREWER

Alexander C. Daswick, 647 Orange Grove No. 209, South Pasadena, Calif. 91030

Filed Mar. 27, 1975, Ser. No. 562,707
Int. Cl.² A47J 31/06, 31/02
U.S. Cl. 99—295 17 Claims



1. A beverage brewer, which comprises:

a. a disposable brewing element having an open top and a closed bottom, and having contained in a lower region thereof a pre-selected quantity of coffee grounds or the like,

said brewing element being adapted to receive a supply of liquid and being liquid permeable,

b. a liquid diverting element disposed within said brewing element above said coffee grounds or the like,

said diverting element being buoyant and substantially nonporous, and substantially covering said coffee grounds or the like in its lowest position, whereby to divert liquid poured into said brewing element from being poured directly onto said coffee grounds, and

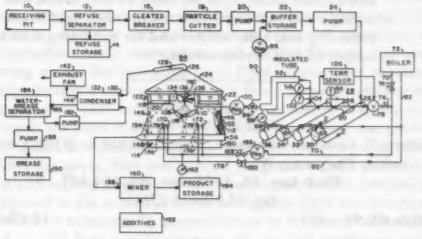
c. means disposed within said brewing element above said coffee grounds or the like for movably retaining said diverting element generally within said brewing element,

said retaining means allowing said diverting element to float at substantially any level of liquid within said brewing element, and retaining means also retaining said coffee grounds or the like within said brewing element and allowing a flow of liquid thereto.

3,971,306
SYSTEM FOR MANUFACTURING ANIMAL FEED

Frank D. Wiese; Donald F. Link, both of Huntsville, and Charles W. Brown, Guntersville, all of Ala., assignors to Cord Systems, Inc., Huntsville, Ala.

Filed July 30, 1974, Ser. No. 493,173
Int. Cl.² A23K 1/10, 1/14
U.S. Cl. 99—348 3 Claims



1. A system for the manufacture of animal feed comprising:

pulverizing means, including means for receiving animal and vegetable material and liquid for providing as an output an emulsion wherein solid particle sizes are held to 0.02 inch in maximum dimension;

heating means having an inlet and outlet, and comprising means for receiving the output of said pulverizing means at said inlet and raising the temperature of said emulsion to 240° to 300°F. at a pressure of 40 to 90 PSI and discharging said emulsion at said outlet, and comprising:

at least one heated elongated tube, having an inlet and outlet, and stirring means within said tube for stirring said emulsion and preventing said emulsion from adhering to the inner surface of said tube,

buffer storage means having first and second inlets and an outlet, said first inlet being coupled to the output of said pulverizing means, and said outlet being coupled to an inlet of said elongated tube, and

valve means having an inlet connected to the output of said elongated tube and having first and second selected outputs, said first output being connected to said second inlet of said buffer storage means, whereby, selectively, said emulsion may be initially recirculated through said buffer storage means and said heating means until the emulsion is heated to a temperture of 240° to 300°F. and thereafter supplied to said second output;

sterilization means comprising:

an insulated chamber having an inlet coupled to said second output of said heating means,

an intermediate region, and

an outlet, whereby the heated emulsion is received at said inlet and passed through said insulated chamber to said

outlet at a temperature of 240° to 300°F. during transit of said emulsion through said chamber;

pumping means for pumping said emulsion from said pulverizing means through said heating means and said sterilization means with a transit time of 10 to 30 seconds through said sterilization means; and

drying means having an inlet coupled to said outlet of said sterilization means for receiving sterilized emulsion from said sterilization means and separating moisture and grease from said emulsion, whereby a solid material is provided as an output, and comprising:

an enclosure, including means for providing a reduced pressure within said enclosure compared to that in said heating means,

a pair of rotating heated drums, said drums being positioned within said enclosure side-by-side, and wherein adjoining rotating surfaces of said drums have a like direction of peripheral movement, and wherein at the closest region between drums there is a spacing of 0.002 to 0.030 inch,

means for spraying said emulsion from said sterilization means into a region of said enclosure above said drums, whereby liquid portions of the emulsion are substantially vaporized by virtue of reduced pressure and solid matter is directed onto and between the adjacent rotating drums, and whereby a film of material forms, dries, and initially adheres to the sides of said drum, and

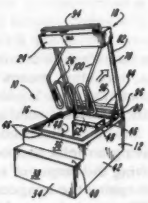
scraping means in engagement with each said drum for removing said solid matter and for providing it as said output of said drying means.

3,971,307

DEEP FAT FRYER

Glenn N. Graham, Cheyenne, Wyo., assignor to Wyott Corporation, Cheyenne, Wyo.

Filed Aug. 14, 1975, Ser. No. 604,847
Int. Cl.² A47J 37/12
U.S. Cl. 99—403 **12 Claims**



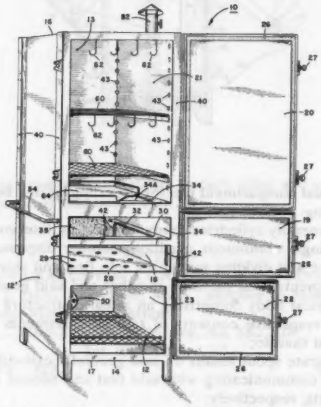
1. The deep fat fryer which comprises: a generally rectangular box having front and rear endwalls and sidewalls cooperating with one another to define an open-topped well; an open-topped reservoir for cooking oil removably mounted within the well in the box; an open-topped lid subassembly hingedly attached to the box for movement between a closed position atop thereof and an open position raised to a height that will permit removal of the reservoir from the well in the box, said lid subassembly including a pair of hollow arms pivotally attached at their rear ends to the upper outside corners of the rear endwall of the box and extending forwardly therefrom along the sidewalls of the latter to its front endwall, a housing connected to the front ends of the arms extending transversely therebetween along the front endwall of the box atop which it rests in the closed position of said lid subassembly, an electrically-powered heating element connected to the housing and projecting therefrom down along the front wall of the reservoir and along the bottom thereof, and control means mounted on the front of the housing and connected to the heating element operation to actuate the latter and regulate the temperature thereof; and, means comprising a power cord connectable to a source of electrical energy entering the rear endwall of the box and passing therefrom in heat-shielded rotation to the control means at the front of the lid subassembly through the hollow arms thereof.

3,971,308

PORTABLE SMOKEHOUSE

Darrell G. Parker, F.M. 159, P.O. Box 422, Millican, Tex. 77866

Filed July 21, 1975, Ser. No. 597,801
Int. Cl.² A23B 4/04
U.S. Cl. 99—467 **4 Claims**



1. A portable smokehouse having a box-shaped housing, comprising:

a top wall, a bottom wall, a rear wall, a front wall, and side walls between said top and bottom walls;

means vertically spaced below said top wall forming a comestible chamber therebetween;

said means and said bottom wall forming a firebox therebetween;

vertically positioned duct means in smoke communication between said firebox and said comestible chamber for carrying smoke into said comestible chamber and;

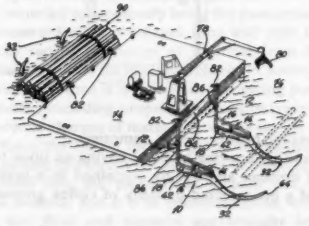
a heat insulating tray removably positioned above said firebox whereby when said tray is removed from said housing, heat and smoke will move directly from said fire box into said comestible chamber.

3,971,309

LOG BUNDLING APPARATUS AND METHOD OF BUNDLING LOGS

Wilfred Spry Brodie, P.O. Box 175, Gibsons, British Columbia V0N 1V0, Canada

Filed Apr. 10, 1975, Ser. No. 566,904
Int. Cl.² B63B 27/16
U.S. Cl. 100—2 **12 Claims**



1. A log bundling apparatus comprising:

at least one L-shaped frame, each L-shaped frame including a leg portion and a base portion extending outwardly from and rigidly connected to the leg portion, each leg portion adapted to be secured to a support structure situated within a body of water, whereby each base portion and a lower section of each leg portion is adapted to be submerged beneath a surface of a body of water;

an arm structure pivotally secured to each base portion adjacent a free end thereof;

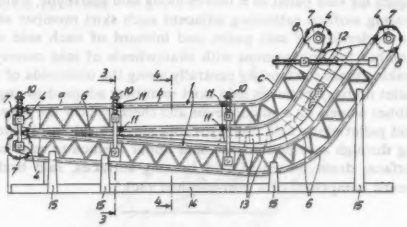
actuating means mounted between each L-shaped frame and each arm structure, the actuating means adapted to pivot its respective arm structure from an open position in which each arm structure is submerged beneath the surface of the water and a closed position wherein a free end of eacn arm structure extends above the surface of the water, whereby each arm structure is adapted to engage logs situated above each arm structure and its respective submerged base portion so as to urge the logs towards its respective leg portion as each arm structure is being advanced into the closed position by the actuating means, thereby forming a compact bundle of logs which can be secured together.

3,971,310

PRESS FOR SQUEEZING AGRICULTURAL PRODUCTS

George C. Kondos, Patission Street, 153, and Dimitrios I. Angelou, Sevastoupoleos Street, 47-49, both of Athens, Greece

Filed Feb. 18, 1975, Ser. No. 550,746
Claims priority, application Greece, Feb. 16, 1974, 49623
Int. Cl.² B30B 9/24
U.S. Cl. 100—118 13 Claims



1. A press for squeezing agricultural products comprising

a pair of perforated endless belt means disposed in opposed relation to each other;

guide means mounting said pair of belt means therein to define a converging passageway between said pair of belt means from an entrance end to an exit end, said guide means including a series of guide rails guiding each endless belt means, said guide rails being separated into a plurality of articulated sections;

means for driving said pair of belt means in opposite directions;

a pair of perforated vertical side walls between said pair of endless belt means, each said side wall being disposed on an opposite side of said passageway; and

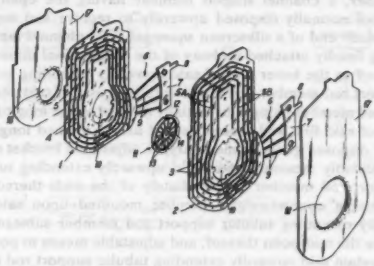
spring means secured to said guide means for resiliently mounting said guide rail sections and belt means therein relative to each other to permit an outward vertical adjustment of said guide rail sections and said belt means therein to the other in response to excess pressure within said passageway.

3,971,311

STRIKING DEVICE FOR DOT PRINTER

Jacques Roland Deproux, Sevres, France, assignor to Compagnie Honeywell Bull (Societe Anonyme), Paris, France

Filed Feb. 15, 1974, Ser. No. 442,834
Claims priority, application France, Feb. 19, 1973, 73.05754
Int. Cl.² B41J 1/28
U.S. Cl. 101—93.04 17 Claims



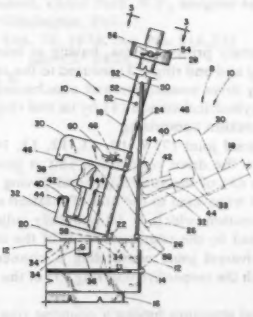
1. Striking device for a dot printer, said striking device comprising an electrodynamic coil operatively associated with a striking hammer and connected to a current generator, a deformable elastic suspension unit carried by said coil and having means for mounting on a fixed support, for substantially rotational movement about a first axis perpendicular to the plane of said coil, said coil being generally a spiral and being in the form of a thin foil sheet having at least one generally spiral cut therein dividing said sheet into two parallel rectilinear parts, first and second magnetic means providing first and second magnetic fields, the first rectilinear part being subjected to the action of the first magnetic field the direction of which is substantially perpendicular to the plane of the coil and to said first rectilinear part, the second rectilinear part being subjected to the action of the second magnetic field the direction of which is opposed to the direction of the first magnetic field.

3,971,312

ADJUSTABLE SQUEEGEE HOLDING DEVICE FOR SILKSCREEN PRINTING FRAME

Othmar Carli, 341 Baltimore St., Gettysburg, Pa. 17325

Filed May 19, 1975, Ser. No. 578,663
Int. Cl.² B41F 15/02, 15/36
U.S. Cl. 101—114 7 Claims



1. An adjustable squeegee holding and counterbalance device for a silkscreen printing frame comprising in combination, a silkscreen printing frame, a printing bed, a mounting bracket member firmly affixed in flush complementary abut-

ment to an upper corner surface of said silkscreen printing frame, hinge means connecting one side of said printing frame to said printing bed and said mounting bracket member having affixed to a first leg thereof a first set of axially aligned longitudinally disposed gudgeon members, an upwardly extending tubular support rod member, a second set of axially aligned longitudinally disposed gudgeon members complementary with said first set and connecting one end of said tubular support rod member to said first leg of said mounting bracket member, a channel shaped member having the open face thereof normally disposed upwardly to receive and support the blade end of a silkscreen squeegee, said channel member being fixedly attached midway of the longitudinal dimension thereof to the lower end of said upwardly extending tubular support rod member and the longitudinal axis of said channel shaped member being substantially parallel to the longitudinal axis of said first and second sets of axially aligned longitudinally disposed gudgeon members, an adjustable bracket member slidably mounted upon said upwardly extending tubular support rod member intermediately of the ends thereof, an adjustable counterweight member mounted upon said upwardly extending tubular support rod member substantially above the mid-point thereof, and adjustable means to position and retain said upwardly extending tubular support rod member at an outwardly disposed angle relative to said silkscreen printing frame.

3,971,313
ATTACHING PRINTING STENCILS TO ROTARY SCREEN PRINTING PRESSES

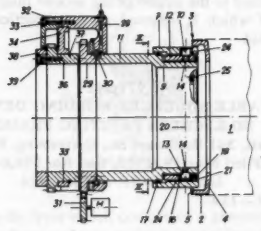
Heinrich Voegelin, Wiler near Utzenstorf, Switzerland, assignor to Fritz Buser AG Maschinenfabrik, Wiler near Utzenstorf, Switzerland

Filed Jan. 18, 1974, Ser. No. 434,418

Claims priority, application Switzerland, Jan. 29, 1973, 1238/73

Int. Cl.² B41F *15/38*; B41N *1/24*

U.S. Cl. 101—127.1 **5 Claims**



1. A rotary printing press, having at least one cylindrical stencil (1) and end rings (3) secured to the axial ends thereof,

a rotary drive connection and attachment means to secure the cylindrical stencil (1) by its end rings (3) to the drive connection comprising

a universal joint (7, 9, 10, 11, 12, 13, 14) interposed between the drive connection and at least one of the end rings (3) of the stencil (1) and having a plane of movement transverse to the axis of rotation of the rotary drive connection which is immediately adjacent to a plane defined by the respective ends of the stencil (1);

the universal joint comprising a connecting ring (7) to which the respective end ring (3) of the stencil is secured; and

a gimbal structure having a coupling ring (12) and radially extending connecting pairs of gimbal pins (10,13), the pairs of gimbal pins being offset by 90° with respect to each other, one of said gimbal pin pairs (13) movably connecting the respective end (9) of the drive connection with the gimbal ring (12) and the other of said gimbal pin pairs (10) movably connecting said gimbal ring (12) with the connecting ring (7).

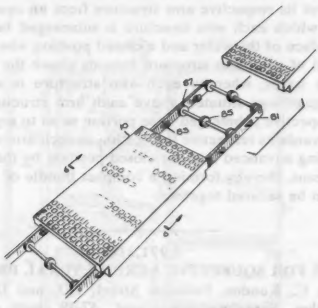
3,971,314
SKATEWHEEL CONVEYOR PALLET

Theodor Max Box, 1108 Aileen Road, Brielle, N.J. 08730

Filed Apr. 2, 1975, Ser. No. 564,375

Int. Cl.² B65D *19/00*

U.S. Cl. 104—135 **3 Claims**



1. A skatewheel conveyor pallet comprising an open latticework grid defining an upper load bearing surface, an underside adapted for contact with the skatewheels of said conveyor, a pair of depending skirt members disposed along opposite side edges of said pallet and extending below the level of said upper surface, said skirt members adapted to extend beyond the sides of said conveyor and provide guide means for said pallet as it moves along said conveyor, a closed bearing surface extending adjacent each skirt member along the underside of said pallet and inboard of each said skirt member for engagement with skatewheels of said conveyor, braking means extending centrally along the underside of said pallet midway between said skirt members adapted to engage rubber wheels on said conveyor and thereby slow the speed of said pallet along said conveyor, openings in said grid extending through said pallet from said upper surface to said lower surface, drain means in said bearing surfaces, said braking means comprised of a gear-toothed rack.

3,971,315
MACROPOROUS MICROPOROUS MARKING STRUCTURE

Frederick C. Hansen, Union Grove, Wis., assignor to Porelon, Inc., Racine, Wis.

Filed Aug. 12, 1974, Ser. No. 496,677

Int. Cl.² B41K *1/42*

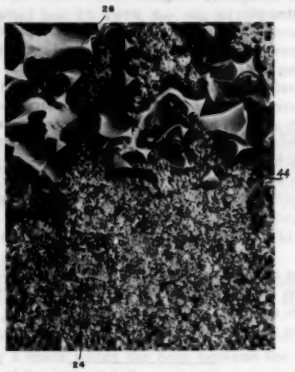
U.S. Cl. 101—333 **16 Claims**

1. A multi-layered marker comprising:

an outer layer having a microporous material formed of aggregated particles of plasticized thermoplastic resin, said aggregated particles forming a substantially uniform cohesive structure defining a network of pores, and a marking fluid contained within said network, said fluid being substantially incompatible with said resin; and

a reservoir layer underlying said outer layer and comprising an open-pored macroporous elastomeric structure, a microporous material impregnated within said macroporous structure, said microporous material being formed of aggregated particles of plasticized thermoplastic resin and defining within said macroporous structure a network of pores, and a marking fluid contained within said network, said fluid being substantially incompatible with the thermoplastic resin of said reservoir and outer layers, said aggregated particles of said reservior and outer layers

being interconnected to join the layers, permitting the continuous passage of marking fluid from the network of



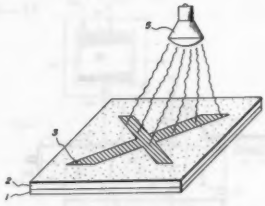
pores of said reservoir layer to the network of pores of said outer layer.

3,971,316

PROCESS FOR SMOOTHING WATERLESS LITHOGRAPHIC MASTERS

Richard L. Schank, and Wolfgang H. H. Gunther, both of Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 28, 1974, Ser. No. 473,601
Int. Cl.² B41N *3/00*; B41C *1/10*
U.S. Cl. 101—465 **11 Claims**



1. A method of removing irregularities on the surface of a waterless lithographic master comprising providing a waterless lithographic master comprising an adhesive silicone which is deformable at elevated temperature and having an image formed of depressions in the silicone, said master additionally having surface irregularities in the non-imaged areas which accept ink or surface irregularities in the imaged areas resulting in a lack of clarity; selectively heating said master at a temperature and for a time sufficient to smooth out said irregularities without collapsing the image.

3,971,317

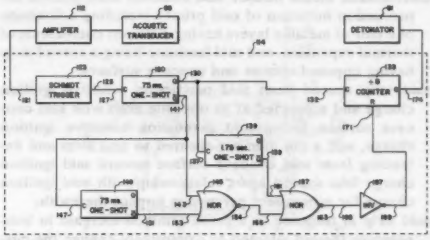
DETONATION SYSTEM AND METHOD

Frank S. Gemmell, and Mark A. Fried, both of Scottsdale, Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed Oct. 7, 1974, Ser. No. 512,651
Int. Cl.² E21B *43/26*
U.S. Cl. 102—21 **17 Claims**

1. A method for triggering a detonator situated at a remote position linked by a conduit means capable of providing acoustic propagation comprising the steps of:

acoustically coupling receiving means at the remote end of said conduit means, said receiving means including means for receiving an acoustic wave signal and for decoding a predetermined modulation of said acoustic wave signal comprising sequential digital pulse coding from said conduit and generating an output electrical signal for actuating the detonator in response to said reception of said sequential digital pulse coding modulation signal; and



acoustically coupling transmitting means a distance away from said receiving means, said transmitting means including means for generating said sequential digital pulse coding modulation signal and means for enabling said transmitter means to send said coded acoustic wave signal to said receiving means.

3,971,318

EXPLOSIVE ASSEMBLY COMPRISING A TUBULAR MEMBER FORMED OF WATER-SOLUBLE PLASTIC

William C. Burkle, and Clyde W. Ello, both of Wilmington, Del., assignors to Hercules Incorporated, Wilmington, Del.

Filed Dec. 18, 1972, Ser. No. 316,333
Int. Cl.² F42B *3/00*, *3/02*
U.S. Cl. 102—24 R **7 Claims**

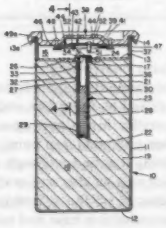
1. An explosive assembly for use in a water-distended borehole, comprising as an intact unit in said borehole, a tubular member and an explosive contained therein; said tubular member formed in its entirety from a water-soluble plastic material, and having its wall thickness correlated with its water solubility so that its rate of solution in the water in contact therewith does not impair its integrity as an intact tubular unit during an initial period of at least about one hour in said water contact; and means for detonating said explosive.

3,971,319

THERMALLY ACTUATED PERCUSSION INITIATABLE EXPLOSIVE CARTRIDGE ASSEMBLY

Richard Ralph Larson, Ulster Park, N.Y., assignor to Hercules Incorporated, Wilmington, Del.

Filed Oct. 18, 1974, Ser. No. 516,232
Int. Cl.² F42B *3/10*
U.S. Cl. 102—24 R **11 Claims**



1. An explosive cartridge assembly which comprises

a shell, and at least a portion of same enclosed and containing a main explosive charge;

a percussion initiatable primer extending into said shell and into said main charge therein, said primer including a percussion sensitive ignition charge adjacent an external wall of said enclosed shell portion and a base explosive charge detonatable in operative response to ignition of said ignition charge and disposed in detonating relationship with said main charge;

thermostatic means outside said enclosed shell portion for percussion initiation of said primer including a laminate of a pair of metallic layers having different coefficients of thermal expansion, and said laminate being a curved strip having opposed convex and concave surfaces;

said strip spaced from said percussion sensitive ignition charge and supported at its opposite ends with said concave surface facing said percussion sensitive ignition charge, and a pin member secured to said strip and extending from said concave surface toward said ignition charge into spaced apart relationship with said ignition charge for subsequent percussion impact therewith;

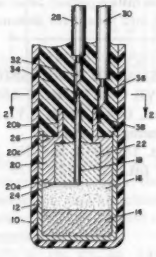
said strip in response to a predetermined increase in temperature thereof adapted to expansively change the curvature of said convex and concave surfaces respectively toward concave and convex so as to move said pin into said percussion impact and cause percussion ignition of said ignition charge, thereby providing for subsequent detonation of said primer charge and in turn said main explosive charge; and

means for admitting flow of sufficiently hot fluid into contact with said laminate strip for transfer of heat from said fluid to said laminate strip to cause said strip to change its curvature to move said pin member into said percussion impact, to thereby initiate said primer for detonation of said main explosive charge.

3,971,320
ELECTRIC INITIATOR

John T. M. Lee, Phoenixville, Pa., assignor to ICI United States Inc., Wilmington, Del.

Filed Apr. 5, 1974, Ser. No. 458,360
Int. Cl.² F42B 3/12
U.S. Cl. 102—28 R 5 Claims



1. An electric initiator comprising:

a. a cup-shaped nonconductive cylindrical outer case open at one end and closed at the other end;

b. a cylindrical metallic inner cup open at one end and closed at the other end, said cup being of one piece construction comprising a cylindrical wall and an end wall at one end, the thickness of the end wall being at least as great as the thickness of the cylindrical wall, the open ends of said nonconductive case and said inner cup being oriented in the same direction, said outer case completely surrounding the side and closed end of said inner cup so as to prevent accidental grounding of said inner cup;

c. an explosive charge within said inner cup;

d. a coaxial plug assembly within said inner cup adjacent to said explosive charge, said assembly comprising

1. an elongated, longitudinally extending conductive center pin;

2. a conductive sleeve surrounding said pin and coaxial therewith but spaced therefrom, said conductive sleeve being in engagement with said inner cup,

3. a refractory insulator separating said pin from said sleeve, said insulator forming refractory-to-metal seals with said pin and said conductive sleeve, and

4. a bridge element connecting said pin with said sleeve, said bridge element being in proximity with said explosive charge;

e. means forming a moisture proof seal between said inner cup and said sleeve;

f. a pair of lead wires extending through the open end of said case;

g. means connecting one of said lead wires to said pin;

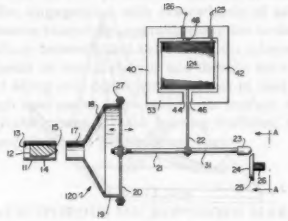
h. means connecting the other of said lead wires to said sleeve; and

i. potting material sealing the open end of said case.

3,971,321
FLUID DRIVEN ELECTRICAL-MECHANICAL SAFETY AND ARMING SYSTEM

Francis E. Blodgett, Silver Spring, and Carl J. Campagnuolo, Potomac, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 6, 1974, Ser. No. 503,999
Int. Cl.² F42C 5/00; H02K 7/06
U.S. Cl. 102—81 4 Claims



1. A fluidically actuated safety and arming mechanism comprising:

resonant means having a fluid input port and a diaphragm output for oscillating said diaphragm at a resonant frequency;

a linear rod mounted at one end to said diaphragm axially extending substantially perpendicular therefrom and having a mass mounted on its other end;

a smooth surface gear capable of rotation positioned adjacent the other end of said rod such that axial motion of said rod at said one end produced by oscillation of said diaphragm becomes elliptical motion of said mass in a plane perpendicular to said rod at said other end by engaging said gear, said elliptical motion at said other end causes said gear to rotate; and,

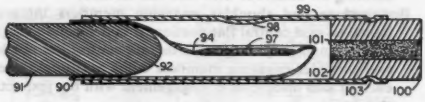
a reed mounted at one end to said rod to move there with and means associated with the other end of said reed for producing electrical energy from the movement of said reed.

3,971,322

PRESSURE ACTUATED TUBE PRIMER

Charles R. Olsen, 307 Conestoga Way, Suite 37, Eagleville, Pa. 19408

Filed Jan. 23, 1975, Ser. No. 543,553
Int. Cl.² F42C *19/08*
U.S. Cl. 102—86.5 6 Claims



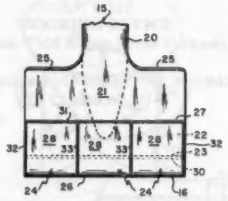
1. A tubular primer comprising:
a deformable metal tube having at least one indented portion defining a longitudinally extending, concavely-shaped cavity on the exterior thereof;
a case having a bore into which the tube is telescoped and defining a space within the bore between the indented portion of the tube and the case; and
a percussion-ignitable primer mixture situated within said space between the indented portion and the case whereby the indented portion may be deformed by internal force within the tube, crushing the primer mixture against the case wall thereby igniting and deflagrating the primer mixture.

3,971,323

TAMPING BLADE AND A HARD WEAR-RESISTANT INSERT THEREFOR

Richard W. Beiswenger, Penn Hills Township, Pa., assignor to Teledyne Mid-America Corporation, Los Angeles, Calif.

Filed Feb. 19, 1975, Ser. No. 551,042
Int. Cl.² E01B *27/00*
U.S. Cl. 104—10 7 Claims



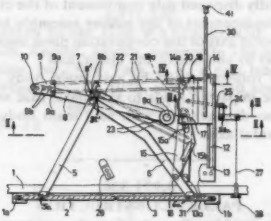
1. A tamping blade insert comprising:
A. a body of hard wear-resistant material having first and second opposed sides and first and second opposed major surfaces, said surfaces being angular to each other to provide a substantially uniform thickness for the body at each side;
B. said first side of the body having a thickness of at least about ⅝ inch and adapted to provide a leading edge for a tamping blade extending across the thickness of the leading edge of said tampiing blade, and said first major surface being adapted to provide a wear-resistant facing for said tampiing blade during lateral movement; and
C. said second side and said second major surface being adapted to support the body on said tamping blade for impact loading of said first side of the body.

3,971,324

AUTOMATICALLY ACTUATED SUSPENDED RAILWAY CABIN CLOSURES

Anton Frech, Schongrund 21, 4600 Olten, Switzerland

Filed Mar. 18, 1974, Ser. No. 452,435
Claims priority, application Switzerland, July 17, 1973, 10366/73
Int. Cl.² B61B *1/02, 3/00, 7/06;* B61D *19/00*
U.S. Cl. 104—28 7 Claims



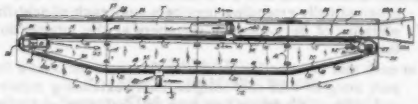
1. A cable transport system comprising two control rails secured at each station for a cabin, each cabin being provided with a cabin door, a locking mechanism for locking the cabin door when in its closed position, an actuation lever mounted for rotation about an axis of rotation and with which the door is operatively connected, a tension device having one end engaging with an end of the actuation lever, said tension device is an intermediate position of the door intersecting an extension of the axis of rotation of the actuation lever, a control element movable between two terminal positions, a feeler element connected with said control element, said feeler element during scanning of the control rails displacing the control element from one terminal position into the other terminal position, the cabin door being opened in one terminal position and closed in the other terminal position, said control element comprising a carriage, a guide rail fixedly connected with the cabin, said carriage being displaceable along said guide rail, an unlocking element cooperating with said locking mechanism, said carriage when assuming a position at a location between both of its terminal positions unlocking the locking mechanism of the cabin door via the unlocking element, said carriage being connected with the other end of the tension device.

3,971,325

VEHICLE CONVEYOR

Lyle B. Evans, 3520 SW. 108th Ave., Beaverton, Oreg. 97005

Filed Feb. 28, 1975, Ser. No. 554,204
Int. Cl.² B61B *13/12*
U.S. Cl. 104—172 B 5 Claims



1. A vehicle conveyor adapted for placement on a continuous floor surface for moving driverless vehicles along a desired path, said conveyor comprising,
a base comprised of interconnected plate members for placement on the floor surface,
an endless roller chain including upwardly disposed side components, said chain having runs lengthwise disposed on said base,
upwardly opening chain guideways in place on said interconnected plate members of the base with each of said guideways in communication with a remaining guideway

and confining said chain runs for advancement along a desired course, said guideways open at their upper extremeties, and

pusher assemblies disposed at points along said chain, each independently engagable with the wheel of a vehicle and including,

a main body including an upright portion and an upper offset portion,

cooperating pivot means carried by said upper offset portion of the main body and the upper surface of an upwardly disposed side component of the chain permitting displacement of the pusher assembly body about a horizontal axis of the cooperating pivot means disposed parallel to and above the chain, and

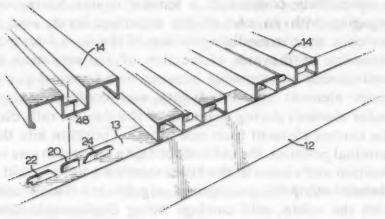
multiple rollers carried by said main body transferring vehicle imparted loads to said base, said multiple rollers also displaceable with said main body about said horizontal axis.

3,971,326

PALLET CONSTRUCTION

Ferdinand M. Svirklys, Toronto, Canada, assignor to Extrados Company Limited, Toronto, Canada

Filed May 21, 1975, Ser. No. 579,410
Int. Cl.² B65D *19/28*
U.S. Cl. 108—56.1 **26 Claims**



1. A pallet construction comprising:

at least two spaced-apart substantially-parallel longitudinally-extending aluminum members,

a first plurality of deck-forming aluminum members contacting and extending at least between the at least two longitudinally-extending members generally transverse thereto in spaced-apart relation,

each of said first plurality of deck-forming members having at least one planar portion cooperating with the at least one planar portion of the others of said first plurality of deck-forming members to provide a first planar pallet deck surface which extends substantially the length of said longitudinally-extendable members,

snap fit means releasably interconnecting said at least two longitudinally-extending members with each of said first plurality of deck-forming members at the intersections thereof,

at each said intersection, said snap fit means includes a first part integral with said longitudinally-extending member and a second cooperating part integral with said deck-forming member, and

stop means located at each said intersection and preventing movement of each of said first plurality of deck-forming members longitudinally thereof and transverse to said at least two longitudinally-extending members while normally permitting movement of said first plurality of deck-forming members out of contact with said longitudinally-extending members upon release of said snap fit means to allow disassembly of said pallet,

said stop means at each said intersection including cooperating elements integral with said longitudinally-extending member and integral with said deck-forming member.

23. In combination,

a first substantially rigid elongate member having a flat surface,

a second elongate member having a flat central portion thereof in engagement with said flat surface,

first and second projections upstanding from said flat surface of said first member, each of said projections having a shoulder projecting therefrom in opposite directions to each other generally parallel to said flat surface and defining an undercut with said flat surface,

first and second shoulder engaging members integrally joined to said central flat portion of said second elongate member and projecting towards said central flat portion, said shoulder-engaging members being positioned one in each of said undercuts in engagement with the respective shoulder,

said second elongate member being capable of limited flexure about its centre line for release of at least one of said shoulder-engaging members from its respective undercut to allow separation of the second elongate member from the first elongate member,

a third projection upstanding from said flat surface of said first elongate member, and

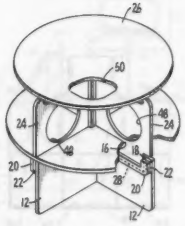
an opening in said central portion of said second elongate member receiving said third projection therethrough preventing movement of said second elongate member transverse of said first elongate member and normally permitting said separation of the second elongate members from the first elongate member upon said limited flexure.

3,971,327

MULTIPURPOSE TABLE

Paul J. Critchett, 10 Elm Ave., San Anselmo, Calif. 94960

Filed Jan. 27, 1975, Ser. No. 544,354
Int. Cl.² A47B *37/00*
U.S. Cl. 108—60 **8 Claims**

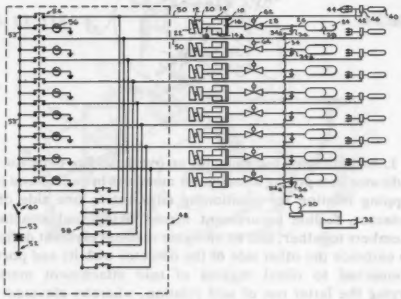


1. A multipurpose table comprising, in combination: a generally planar top supported on panel-like legs disposed in intersecting cruciform relationship relative to one another and fixedly connected to the under side of the top so as to extend generally normal thereto, said top having an upper surface and slots extending therethrough adjacent the connection of the legs to the undersurface; pockets supported on the panel-like legs in alignment with the slots extending through the top; partitions received within said slots and the pockets in alignment therewith, said partitions disposed in intersecting cruciform relationship to one another and extending upwardly from said top to divide the upper surface thereof into a plurality of work areas which are isolated from one another, said partitions being removable from said slots and pockets to convert the upper surface of the top into a condition wherein it is not interrupted by the partitions.

3,971,328
EMERGENCY MOORING RELEASE

Porter R. Edling, Houston; Kenneth L. Yoast, Texarkana, both of Tex., and Glenn D. Wickline, deceased, late of Houston, Tex. (by Mrs. Glenn D. Wickline, executrix), assignors to The Offshore Company, Houston, Tex.

Filed Sept. 21, 1973, Ser. No. 399,404
Int. Cl.² B63B 21/50
U.S. Cl. 114—221 R **11 Claims**



1. A system for emergency release of a ship from its mooring cables comprising:

a plurality of fluid powered cable cutters, one cutter being prearranged in operable relationship to each cable for which emergency release may be desired and being adapted upon actuation to sever said cable;

charged accumulator means for storing under pressure actuating fluid for actuating said cable cutters;

fluid communication means interconnecting said cutters and said accumulator means;

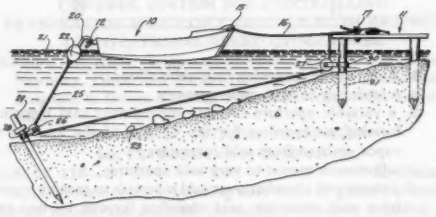
valves means in said fluid communication means for selectively blocking or permitting flow of actuating fluid from said accumulator means to said cutters; and

remote control means for selectively operating said valve means.

3,971,329
MOORING DEVICE

Arthur J. Kosmatka, 7766 Honey Creek Parkway, Milwaukee, Wis. 53219

Filed July 19, 1974, Ser. No. 490,043
Int. Cl.² B63B 21/16
U.S. Cl. 114—230 **2 Claims**

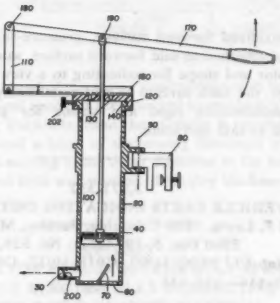


1. In a mooring device for mooring a boat in a body of water in the vicinity of a pier; a bar driven into the ground beneath the water at a distance from the pier; a first pulley rotatably supported by said bar with the pulley being fully submerged in the water and being disposed adjacent to the bed of the body of water; securing means on said pier for receiving lines that are secured to it; a first line having one end fastened to said securing means and passing about said pulley so that its opposite end is in the water at a distance from the pier; a float secured to said first line at said opposite end which is remote from the pier; a hook secured directly to said float at an end of said float opposite from said line so that said float will keep said hook at the surface of the water and will retain said line in engagement with said pulley; and a second line having one end tied to the boat and its opposite end tied to said securing means on the pier whereby said hook may be engaged with the boat to moor the boat at a distance from the pier but said first line may be released from said securing means so that the boat can be pulled toward the pier by drawing on said second line.

3,971,330
PROPULSION PUMP FOR WATER BORNE VESSELS

Neil S. French, Kodiak, Alaska, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed May 27, 1975, Ser. No. 580,800
Int. Cl.² B63H 1/32
U.S. Cl. 115—32 **2 Claims**



1. A manually operated pump device designed for attachment to and propulsion of water borne vessels, said device comprising:

a vertically elongated pump with an intake port at the bottom and a rearwardly directed exhaust port near the bottom, said pump being operable by an up-and-down motion of a vertical rod, said pump being provided with a first pivoted butterfly valve;

a piston operated by the rod, and cooperating with the first valve, the first valve opening and closing the intake port in cooperation with the up-and-down motion of the piston;

a handle attached to the top of the pump and operating rod, said handle being connected to the rod in a manner that a lever of the second class is formed, said handle being rotatable through a 360° arc and lockable at any position selected; and

a clamp detachably securing the front of the pump to the side of a water borne vessel in a manner that the pump is free to rotate 180° about a vertical axis located outside the body of the pump.

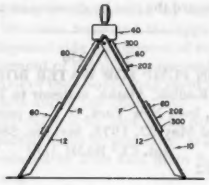
3,971,331
PLASTIC BARRICADE PANEL

Michael J. Sawyer, 5705 Tucker, Omaha, Nebr. 68152

Filed Mar. 1, 1974, Ser. No. 447,388
Int. Cl.³ E01F 9/10; G09F 7/12
U.S. Cl. 116—63 P **10 Claims**

1. A warning barricade of the type having legs, said barricade being self-supporting when on a horizontal surface, said barricade having spaced horizontal rails connected to its legs, said legs comprising a pair of right legs and a pair of left legs, each of said pairs of legs comprising a forward leg and a rearward leg, said pairs of legs being horizontally spaced apart, the legs of each pair inclining divergently downward with respect to each other forwardly and rearwardly respectively, at least one of said rails connecting said forward legs

together and being formed of material separate from said legs, at least one of said rails connecting said rearward legs together and being formed of material separate from said rearward legs, said legs each being generally straight, said rails being formed by a panel of thermoplastic material, said panel pretreated with means for oxidizing other than atmospheric so as



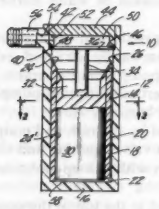
to an oxidized forward surface, pressure-sensitive adhesive material attached to said forward surface, said material being of a color and shape for indicating to a viewer a meaningful message, the back surface of said panel being constructed to have substantially rigid and strong for giving structural strength to said barricade.

3,971,332

VEHICLE PARTS INDICATING INSTRUMENT

Gerald F. Lewis, 1850 Columbia, Berkley, Mich. 48072

Filed Dec. 5, 1974, Ser. No. 529,971
Int. Cl.[2] B60Q *11/00*; G01L *19/12*; G01P *15/00*
U.S. Cl. 116—114 AM 13 Claims



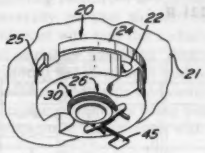
1. An instrument for indicating the operating characteristics of a vehicle, the combination of; a housing forming a cavity therein, a diaphragm disposed in said housing and enclosing one end of said cavity, a piston disposed in said cavity and forming a first chamber in said cavity between said diaphragm and said piston and at one side of the latter, said piston forming a second chamber at the other side of said piston, passage means including an elongated conduit formed in said housing adjacent an outer wall of the latter and communicating said first and second chambers with each other, said conduit extending parallel to the axis of said piston and having a uniform cross-sectional area throughout its length, means connecting said diaphragm and said piston for movement of the latter in response to movement of said diaphragm, a quantity of liquid in said second chamber, means in said vehicle for moving said diaphragm to change the level of liquid in said passage means, said liquid being displaceable into said passage means upon movement of said piston in one direction and being movable out of said passage means into said second chamber upon movement of said piston in the opposite direction, said piston having a surface in said chamber with an area substantially larger than the cross-sectional area of said conduit.

3,971,333

ACTIVATION INDICATOR FOR A FIRE DETECTOR

Albert Levy, 1605 Pennington Road, Philadelphia, Pa. 19151

Filed Mar. 28, 1975, Ser. No. 563,148
Int. Cl.[2] G01k *1/14*; G01K *11/06*
U.S. Cl. 116—114.5 7 Claims



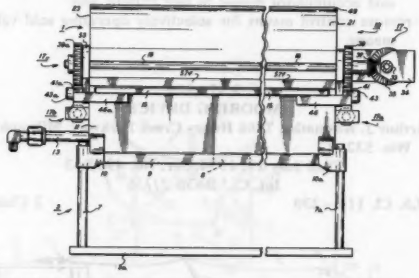
1. An activation indicator for an overhead fire detector, said indicator comprising attachment members in end-to-end overlapping relation for positioning adjacent to one side of the detector, fusible securement means fixing said attachment members together, and an elongate resilient element deflected to embrace the other side of the detector with its end portions connected to distal regions of said attachment members urging the latter out of said relation, whereby elevated temperature melts said securement means to release said attachment members for separation thereof and gravitational falling to indicate said temperature elevation.

3,971,334

COATING DEVICE

Arnold L. Pundsack, Oakville, Canada, assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 4, 1975, Ser. No. 555,339
Int. Cl.[2] C23C *13/12*
U.S. Cl. 118—5 36 Claims



1. A crucible comprising in combination:

a. a reservoir to hold an evaporant;

b. a variable aperture forming means over said reservoir forming an aperture for the control of the amount of vapor emitted from said reservoir;

c. adjustment means to vary said aperture;

d. a vapor exit chamber over said reservoir to receive vapors from said reservoir, said chamber formed by two end members extending above the ends of said reservoir joined by a concave side member extending from over one side of said reservoir and over said aperture and a vertical side member extending from over the opposite side of said reservoir, said members forming an exit aperture at the top for said vapors, and;

e. a deflection baffle positioned on said vertical side member below said exit aperture and extending from said side for a distance sufficient to intersect any plane defined by a straight line between a boundary of said variable aperture to any point on said vertical side member above said

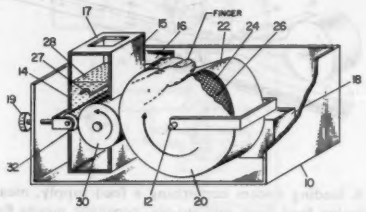
baffle to provide a passage way for said vapor between said baffle and the side concave side member.

3,971,335

FINGERPRINT INKING DEVICE

Daniel L. Curtis, 1956 Ardmore Ave., Manhattan Beach, Calif. 90266, and Allan D. Le Vantine, 18225 Rancho St., Tarzana, Calif. 91356

Filed Nov. 26, 1975, Ser. No. 635,602
Int. Cl.² A61B 5/10
U.S. Cl. 118—6 4 Claims



1. In fingerprinting apparatus, a finger inking device comprising:

an ink reservoir;

a roller applicator operatively associated therewith and means for rotating said applicator in a first direction;

a doctor roll operatively associated with said applicator and means for rotating said doctor in an opposed direction and at a lesser surface speed whereby to effect slippage between said rolls to produce a uniformly thin film of ink on said applicator;

a movable, flexible, elastic, endless member operatively associated with said applicator, having the characteristic of conforming to a finger pressed thereupon, and adapted to be inked by said applicator upon relative movement therebetween;

means to move said endless member to effect said inking of a continuous finite length thereupon; and

each said means to move and to rotate being operative by means actuated by release of pressure of a finger being removed from said endless member;

whereby a subsequent portion of said endless member is inked preparatory to a finger inking operation.

3,971,336

CONTROL SYSTEM FOR CONTROLLING TRANSLATION SPEED OF CARRIAGE WITH RESPECT TO ROTATIONAL SPEED OF MANDREL

Richard W. Allen, Temperance, Mich.; Raymond E. Bond, Newbury, Ohio, and Richard T. Saba, South Bend, Ind., assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed June 27, 1975, Ser. No. 591,240
Int. Cl.² B05C 11/10; B05B 13/02
U.S. Cl. 118—8 10 Claims

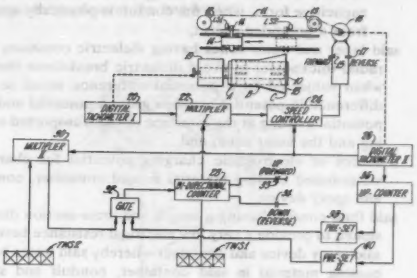
4. In a machine for producing tank walls of glass fiber reinforced plastic, the machine including a rotatable mandrel, a carriage reciprocable axially of the mandrel and carrying means for dispensing hardenable liquid resin and reinforcing glass fiber material on the mandrel, and a reversible variable-speed motor operatively connected to the carriage for reciprocally driving the carriage, a control system comprising:

a. first sensing means for sensing rotation of the mandrel,

b. adjustable means for controlling the speed of the motor and carriage in accordance with the rotational speed of the mandrel as sensed by the first sensing means to produce a layer of uniform thickness in the formation of a tank wall on the mandrel,

c. second sensing means for sensing rotation of the motor as an indication of translational movement of the carriage, and

d. adjusting means for continuously adjusting the adjustable means in accordance with the rotation of the motor sensed by the second sensing means to continuously



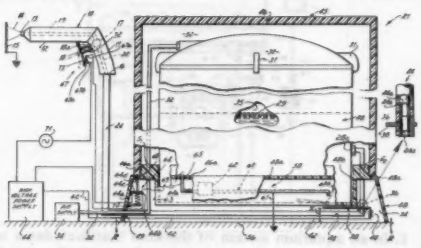
adjust the speed of the motor and carriage with respect to the rotational speed of the mandrel to produce a layer of increasing thickness when the carriage is moving in one direction and a layer of decreasing thickness when the carriage is moving in the other direction in the formation of a tapered tank wall portion of varying thickness on the mandrel.

3,971,337

APPARATUS FOR ELECTROSTATICALLY SPRAYING HIGHLY ELECTRICALLY CONDUCTIVE WATER-BASED COATING MATERIAL

Donald R. Hastings, Elyria, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Filed Jan. 29, 1975, Ser. No. 545,153
Int. Cl.² B05B 5/02
U.S. Cl. 118—629 9 Claims



1. A system for electrostatically spraying highly electrically conductive water-based coating material with improved safety, comprising:

a spray device for directing electrostatically charged water-based coating material toward an object to be coated which is maintained at a potential different from that of the charged coating material,

a container for highly electrically conductive water-based coating material,

a fluid conduit interconnecting said container and said spray device for transporting water-based coating material from said container to said spray device, said fluid conduit having a bore through which coating material is transported from said container to said spray device, said conduit including:

a. an inner zone surrounding said bore, said inner zone including material which is substantially chemically

inert and impermeable to said water-based coating material,

b. an outer zone of dielectric material surrounding said inner zone, said outer zone having an exterior surface which is substantially free of electrically conductive material to minimize the capacitance of the conduit, and hence the electrical energy stored in the conduit in capacitive form, when the conduit is physically spaced from a grounded object,

said inner and outer zones having dielectric constants and radial thicknesses to avoid dielectric breakdown therein when subjected to a potential difference equal to the difference in potential between ground potential and the potential existing at the interface of the transported coating and the inner zone, and

a source of electrostatic charging potential for charging water-based coating material in said container, conduit and spray device,

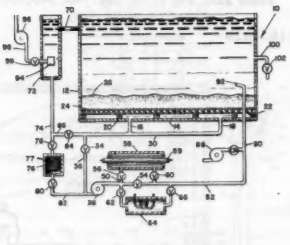
said fluid conduit having a length and cross-section dimensioned to provide a very low electrical resistance between said spray device and container whereby said water-based coating material in said container, conduit and spray device is charged to an electrostatic potential substantially the same as output from said electrostatic charging source.

3,971,338

AQUARIUM APPARATUS

Peter Charles Alexson, Anaheim, Calif., assignor to Sea Life Exhibits, Inc., Anaheim, Calif.

Filed Jan. 30, 1975, Ser. No. 545,611
Int. Cl.² A01K *63/00*
U.S. Cl. 119—5 **4 Claims**



1. In an aquarium system of the kind that includes a tank having a lower outlet and an inlet and a bed of particulate material disposed in said tank above said outlet and below said inlet, the improvement which comprises, in combination:

holding means for holding said bed of particulate material such that the flow of water above said bed to said outlet proceeds through said bed;

main flow path means comprising a flow path for receiving tank water from said outlet and returning it to said tank at said inlet;

pumping means in said flow path for pumping tank water from said outlet to said inlet;

an active chemical filter and an ultraviolet irradiation sterilizer in series with one another and with said pump in said flow path at a point below said tank; and

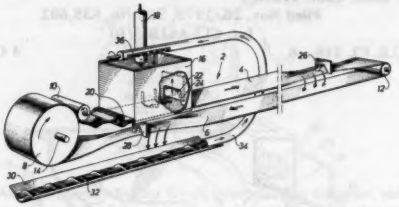
an air stripper filter and air stripper filter flow path means for directing water from said tank at a point above said bed through said air stripper filter and delivering it to said main flow path means at a point upstream from said pumping means.

3,971,339

FEEDING SYSTEM

Erik Sterner, Tomtegatan 9, 331 00 Varnamo, and Elving Nilsson, Nygatan 7, 440 60 Skarhamn, both of Sweden

Filed Jan. 8, 1974, Ser. No. 431,754
Int. Cl.² A01K *39/00*
U.S. Cl. 119—52 AF **9 Claims**



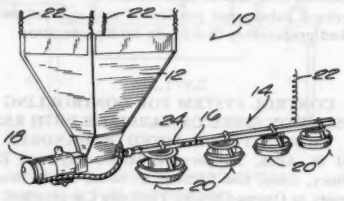
7. A feeding system comprising a feed supply, means for discharging feed from said supply, conveyor means for supporting and conveying substantially the whole amount of feed so discharged along a path, the feed being accessible to the animals over at least a section of the path, said conveyor means including at least two belt portions conveying the feed and positioned in different horizontal planes, and transfer means including an element adapted to impart to the belt an inverted generally V- or U-shaped cross section for transferring the feed from the belt to a collecting means for collecting and returning substantially the whole amount of feed remaining on the belt after the passage of the path to the said feed supply.

3,971,340

LIMIT AND CONTROL FEEDER FOR ANIMALS

Dee Dexter Allen, Zeeland, Mich., assignor to U.S. Industries, Inc., New York, N.Y.

Filed Aug. 19, 1974, Ser. No. 498,364
Int. Cl.² A01K *5/00*
U.S. Cl. 119—52 AF **13 Claims**

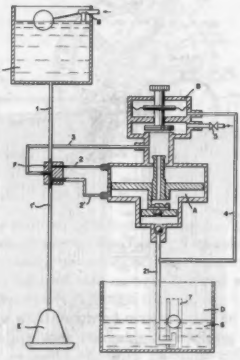


12. A feeder pan assembly comprising a cover member for suspension from a feed trough; a dish-shaped feed pan suspended from said cover member; a feed-accumulating container anchored to said cover member for communication with the trough and having a bottom opening; gate means disposed at the bottom of said container movable between an open and closed position, the bottom of said container being spaced above said pan such that when said gate means is closed, said feed-accumulating container is filled with feed and when said gate means is open, a preselected amount of feed is dispensed by gravity from said container into said pan, said gate means comprising a cone shape and having a base diameter greater than the diameter of said bottom opening; and actuator means for moving said gate means between said open and closed position.

3,971,341
AUTOMATIC PROPORTIONER FOR LOW-PRESSURE WATERING TROUGHS

Dan Bron, Haifa, 36 Palmach St., Romema, Israel

Filed Dec. 13, 1974, Ser. No. 532,408
Claims priority, application Israel, Dec. 18, 1973, 43855
Int. Cl.² G05D 11/03; A01K 7/02
U.S. Cl. 119—72 4 Claims



1. a proportioner designed to supply a medicated solution to automatic watering troughs comprising a piston pump and a hydraulic piston actuator of larger diameter, both linearly movable in a stepped cylinder casing, with their pistons rigidly held in spaced relationship by a tubular spacer which is provided, in proximity of the pump piston, with openings in its wall, and which contains slidingly arranged in its interior a tube valve reaching at its one end to the outside of the casing through a sealing element and closing with its other end, in its innermost position in the said spacer, a valve seat, the tube valve being further provided with outwardly extending projections adapted to engage with corresponding stops in the casing for opening or closing the valve seat, the pump being provided with a suction valve in the cylinder, with a delivery valve in its piston and with ports leading from the delivery valve to the mixing space formed by the inner faces of the two pistons and the spacer on the one hand and by the casing walls on the other hand; the suction stroke of the pump being induced by water under pressure entering the mixing space from the outside through the open tube valve and the openings in the spacer and driving the actuator piston in a direction away from the pump cylinder, while the return stroke is induced, after closing of the tube valve, by water from a raised tank acting on the outer face of the actuator piston and thereby driving the mixture of medicated solution entering the said space through the delivery valve and the water previously contained in this space to the watering troughs through a suitable connection.

3,971,342
LIVESTOCK DUSTING BAG

William C. Cortner, Jr., St. Joseph, Mo., assignor to Dale Alley Co., St. Joseph, Mo.

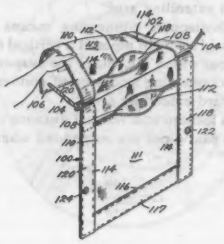
Division of Ser. No. 422,341, Dec. 6, 1973, Pat. No. 3,902,461.
This application May 13, 1975, Ser. No. 577,013
Claims priority, application Canada, Nov. 27, 1973, 186782
Int. Cl.² A01K 13/00, 29/00
U.S. Cl. 119—159 22 Claims

1. A protected self-dusting livestock dust applicator comprising:

a cone-shaped flexible weatherproof outer cover having an apex at one end and an open end at the opposite end,

an inner porous storing and dusting bag having a closed bottom and an open top for filling purposes and being disposed inside said outer cover,

means for elevating the central area of said inner bag bottom substantially relative to the outer edge of said inner bag bottom to prevent central bag sag when dust is disposed in the bag and to cause the dust to spread to said outer edge around the bag bottom,



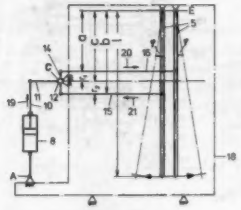
interior means connected between the upper end of said inner bag and apex of said outer cover for hanging the inner bag from a single point within the outer cover and to a height such that the said outer edge of the inner bag bottom is substantially above the said open end of the outer cover, and

exterior means connected at the apex of said outer cover for exteriorly hanging said applicator from a single point.

3,971,343
DEVICES FOR THE CLEANING OF HEATING SURFACES

Erich Ulrich, Mulheim (Ruhr), Germany, and Adrianus Reinier van Liempt, Budel, Netherlands, assignors to Deutsche Babcock & Wilcox Aktiengesellschaft, Oberhausen (Rhine), Germany

Filed Mar. 31, 1975, Ser. No. 563,613
Int. Cl.² F28G 7/00
U.S. Cl. 122—379 11 Claims



1. In a heat exchange apparatus having walls enclosing a heat exchange passage in which heated pipe coils adjacent to one another are suspended at their upper ends at a predetermined level in said apparatus and wherein a jarring means is attached to at least one of said walls and to said pipe coils to clean the coils by jarring vibration;

said jarring means having a lever mounted by a first pivot means to one of said walls and connected to said selected pipes in said pipe coils;

said lever having an upward extending arm and a lower extending arm;

a piston attached to the heat exchanger wall at one end and at its opposite end to said lever to impart vibration to said coils;

a first substantially horizontal connecting means connected to the upper end of said upward extending arm and to selected pipes in said pipe coils;

a second substantially horizontal connecting means connected to the lower end of said downward extending arm and to selected pipes in said pipe coils;

the improvement comprised said upper extending and lower extending lever arms being of unequal length;

said first horizontal connecting means connected to one of said selected pipes at a vertical distance *a* from the level from which said pipes are suspended;

a second pivot connecting said first connecting means to said upward extending arm;

said second horizontal connecting means connected to another of said selected pipes at a vertical distance *b* from the level from which said pipes are suspended;

a third pivot connecting said second connecting means to said downward extending arm;

said first pivot located at a vertical distance *c* from the level from which said pipes are suspended where:

$$c = \frac{2ab}{a+b}$$

3,971,344

SAFETY DEVICE FOR INSTANT WATER HEATER

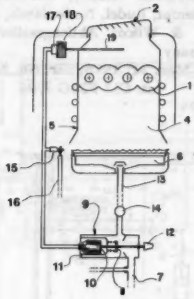
Jacques Gouyou-Beauchamps, Ville d'Avray, France, assignor to Saunier Duval, Rueil Malmaison, France

Filed Jan. 8, 1975, Ser. No. 539,333

Claims priority, application France, Jan. 10, 1974, 74.00763; Feb. 25, 1974, 74.06265

Int. Cl.² F22B *37/42*; F23N *5/02*

U.S. Cl. 122—504 10 Claims



1. A safety device for a gas water heater of the type in which combustion products from a gas burner are vented into the room in which the heater is installed, said device comprising:

a thermal mass having a preselected thermal capacity, said mass being positioned away from the heating zone of said heater:

a probe of preselected thermal conductivity extending from said mass into the heating zone of said heater, thereby to cause the temperature of said mass to increase at an essentially predetermined rate during operation of said burner; the cooling of said mass occuring at an essentially predetermined rate between operations of said burner;

selectively operable throttling means for said burner; and

a temperature sensing means which is responsive to the temperature of said mass and which is interconnected with said throttling means for substantially throttling said burner when the temperature of said mass reaches a preselected threshold temperature.

3,971,345

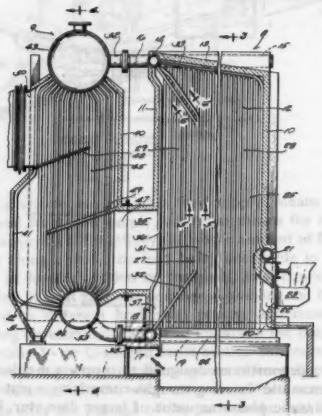
COAL FIRED PACKAGE BOILER

Denis G. Csathy, Minneapolis, Minn., assignor to Deltak Corporation, Minneapolis, Minn.

Filed July 7, 1975, Ser. No. 593,368

Int. Cl.² F22B *37/24*

U.S. Cl. 122—510 7 Claims



1. A coal fired shop assembled water tube steam boiler comprising:

A. means defining a radiant heating section with upper and lower headers and tubes lining its walls and connecting the upper and lower headers;

B. a curtain wall formed of substantially vertically oriented tubes connecting the upper and lower headers and dividing the radiant heating section vertically into primary and secondary combustion zones;

C. a grate at the bottom of said primary combustion zone to support a bed of burning coal;

D. means defining a gas outlet from the lower portion of the secondary combustion zone through which combustion gases and products of combustion emanating from the bed of burning coal may leave the radiant heating section after rising in the primary combustion zone and descending in the secondary combustion zone;

E. means defining a convection heating section with vertically spaced steam and mud drums connected by external downcomer means and internal vertically oriented tubes;

F. means defining a gas inlet near the bottom of the convection heating section and a gas outlet near the top thereof;

G. pipe means for connecting the steam and mud drums of the convection heating section respectively with the upper and lower headers of the radiant heating section; and

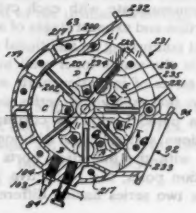
H. duct means for connecting the gas outlet of the radiant heating section with the gas inlet of the convection heating section,

said pipe means and said duct means comprising separable sections respectively fixed with respect to said two heating sections so that the two heating sections can be independently fabricated and transported to an installation site and then mounted with the separable sections of the pipe means and the duct means in mating alignment for subsequent connection.

3,971,346
ROTARY INTERNAL COMBUSTION ENGINE

William W. McReynolds, 6148 Elsa St., Lakewood, Calif. 90713

Filed Sept. 30, 1974, Ser. No. 510,419
Int. Cl.² F02B 53/08
U.S. Cl. 123—8.41 16 Claims



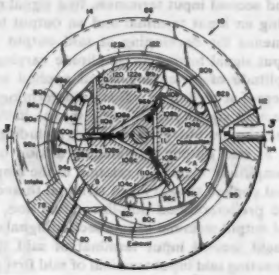
1. A rotary internal combustion engine comprising:
a. an air compressor section having a cylindrical compressor chamber, and a power section having a cylindrical power chamber, each of said compressor and power chambers having separately disposed therein:
   1. a rotor shell mounted eccentrically in said chamber,
   2. a floating vane assembly comprising a floating shaft and a plurality of vanes pivotally connected to said shaft and spaced circumferentially therearound, each vane extending through means defining a vane aperture in said rotor, the axis of each floating shaft being generally concentric with the axis of the respective chamber in which it is positioned but not securely mounted therein so as to permit limited movement of said shaft in directions parallel and radial to the axis of rotation of said rotor, constrained only by the engagement of the ends of said vanes with said chambers,
b. means for coupling said rotor shells for simultaneous rotation;
c. air inlet means communicating with said compressor chamber, and means for directing the compressed air from said compressor chamber to said power chamber;
d. means for delivering fuel to said power chamber for mixture with said compressed air, and
e. igniter means communicating with the interior of said power chamber for igniting said fuel-air mixture, whereby said rotor in said power chamber provides rotational drive force.

3,971,347
ROTARY INTERNAL COMBUSTION ENGINE

Michael Vasilantone, 147 E. First Ave., Roselle, N.J. 07203

Filed Oct. 10, 1973, Ser. No. 405,183
Int. Cl.² F02B 53/00
U.S. Cl. 123—8.45 13 Claims

1. In a rotary internal combustion engine, a cylindrical housing, said housing comprising an annular, ring-like intermediate member, a pair of end plates, one on each side of said annular member and defining an enclosed rotor chamber therewith, a shaft journaled in said end plates and extending through said chamber, a rotor in said rotor chamber and fixed to said shaft for rotation therewith, said rotor chamber being eccentric relative to said rotor to define a crescent-shaped chamber, pivoted vane elements on said rotor and biased into engagement with the annular wall of said rotor chamber as defined by the inner surface of said annular member, and sequentially forming intake, compression, combustion and exhaust chambers in said crescent shaped chamber, each comprising a body portion pivoted to said rotor and a resilient element for engaging said annular wall, said resilient element including a first elongated section attached to said body member and a second integral section bent back from said elongated section in the reverse direction, said second section engaging said annular wall, first passageway means in said housing to admit fuel to said combustion chamber and air to said intake chamber, and power means in said rotor for forcing said vanes into engagement with said annular wall comprising radially extending slots in said rotor and underlying

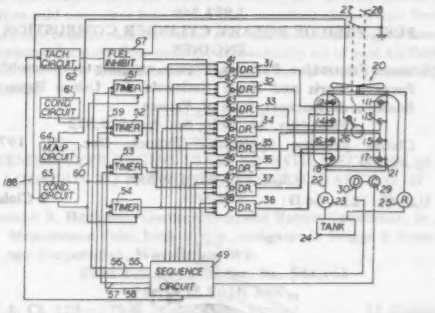


said vanes, reciprocating pistons received in said slots and movable into engagement with the underside of said vanes, and second passageway means in said rotor communicating said slots with said combustion chamber, whereby the gases from said combustion chamber tend to push said pistons against said vanes to pivot said vanes outwardly.

3,971,348
COMPUTER MEANS FOR SEQUENTIAL FUEL INJECTION

Bruce A. Scofield, Fort Wayne, Ind., assignor to International Harvester Company, Chicago, Ill.

Continuation of Ser. No. 467,970, May 8, 1974, abandoned, which is a continuation of Ser. No. 265,051, June 21, 1972, abandoned. This application Apr. 23, 1975, Ser. No. 570,889
Int. Cl.² F02B 3/00
U.S. Cl. 123—32 EA 8 Claims



1. A fuel injection control system for an engine including a plurality of cylinders and fuel injection valve means associated with said cylinders for injection of fuel for flow into said cylinders during the intake strokes thereof and electrically energizable actuator means for said fuel injector valve means, said control system comprising: tachometer means having an output terminal and having means for developing at said output terminal a speed signal in the form of an analog signal having an amplitude varying as a linear function of the speed of rotation of said engine, intake manifold pressure responsive means having an output terminal and having means for developing at said output terminal a pressure signal in the form of an analog signal having an amplitude varying as a linear function of the intake manifold pressure of said engine, control

means coupled to said actuator means and including timer means having first and second input terminals and including means for developing pulse signals with each pulse signal having a time duration controlled as a linear function of the amplitude of an analog signal applied to each of said first and second input terminals to be thereby linearly proportional to the product of the amplitude of said analog signals applied to said first and second input terminals, first signal conditioning means having an input terminal and an output terminal and including means for developing at said output terminal an analog output signal having an amplitude varying in relation to the amplitude of an analog signal applied to said input terminal thereof according to a first predetermined non-linear function, second signal conditioning means having an input terminal and an output terminal and including means for developing at said output terminal an analog output signal having an amplitude varying in relation to the amplitude of an analog signal applied to said input terminal thereof according to a second predetermined non-linear function, means connecting said output terminal of said second signal conditioning means to said second input terminal of said timer means, means connecting said input terminal of said first signal conditioning means to said output terminal of said intake manifold pressure responsive means, said timer means being operative to develop output pulse signals having durations proportional to the product of the amplitudes of the output signals of said first and second signal conditioning means which respectively correspond linearly to engine speed and engine intake manifold pressure except as modified in accordance with said first and second predetermined non-linear functions, and said control means further including means for applying said output pulse signals from said timer means to said actuator means in timed relation to engine rotation for opening said fuel injector valve means for time intervals having durations corresponding to the durations of said output pulse signals and to inject proportioned amounts of fuel for flow into said cylinders, whereby the rate of flow of fuel to the engine is controlled in linear proportion to manifold pressure and the square of the speed of rotation of the engine except as modified by non-linearities in said first and second predetermined non-linear functions.

3,971,349

FUEL FEED OF ROTARY CYLINDER COMBUSTION ENGINES

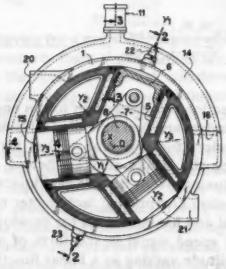
Armand Froumajou, Pontoise, France, assignor to Automobiles Peugeot, Paris and Regie Nationale des Usines Renault, Boulogne-Billancourt, both of, France

Filed Nov. 29, 1974, Ser. No. 528,572

Claims priority, application France, Dec. 27, 1973, 73.46593

Int. Cl.² F02B 57/04

U.S. Cl. 123—44 D **2 Claims**



1. In a combustion engine comprising a stator having an inner wall, a series of induction ports and exhaust ports in the stator inner wall, a fuel feed device communicating with the induction ports, a rotor received in the stator and defining cylinders with the stator inner wall, pistons movable in the cylinders, means for reciprocating the pistons in the cylinders upon rotation of the rotor relative to the stator, a combustion chamber being defined, in each cylinder, between the piston and the inner wall of the stator, means for ensuring that the rotation of the rotor and the reciprocating movements of the pistons are related in such manner that the induction and exhaust ports communicate with each cylinder respectively during the induction and exhaust stages of a four-stroke cycle; the improvement comprising an additional series of induction ports disposed in the stator inner wall in parallel with the first-mentioned series of induction ports so that each induction port of the first-mentioned series communicates with each cylinder in parallel with the corresponding induction port of the additional series, and an additional fuel feed device communicating with the induction ports of the additional series of induction ports, the respective induction ports of each one of the two series having different circumferential extents.

3,971,350

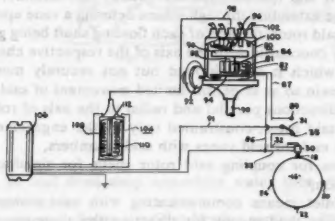
DISTRIBUTOR MEANS FOR HIGH SPEED ENGINES

Bill J. Hays, Midway City, Calif., assignor to Bill J. Hays International Inc., Midway City, Calif.

Filed Feb. 11, 1974, Ser. No. 441,650

Int. Cl.² F02P 5/04

U.S. Cl. 123—117 R **11 Claims**



1. In an internal combustion engine having a crankshaft and a plurality of combustion chambers receiving an air-fuel mixture for combustion therein in a timed angular relationship to the rotation of said crankshaft and a high voltage pulse generating means including coil means with primary and secondary windings for generation of a train of high voltage pulses, a distributor having a distributor shaft rotatably mounted in a distributor housing and mechanically connected in a driven relationship to said output shaft, rotor means carried on said distributor shaft, conductor means extending from the secondary windings of said coil to said rotor and from terminal posts circumferentially disposed about said rotor to direct said train of high voltage pulses to spark means in each of said chambers in said timed relationship, a first voltage pulse generator mounted within said distributor housing and responsive to the rotation of said distributor shaft to generate a first train of voltage pulses in synchronism with the rotational speed of said distributor shaft, spark advance means on said distributor whereby the angular relationship between said first voltage pulse generator and said output shaft is variably adjustable from a minimum to maximum advance in response to varying conditions of one or both of engine speed and/or load to provide a first ignition timing, the improvement which comprises:

a second voltage pulse generator including rotatable means fixedly carried on said crankshaft and cooperative pulse generating means fixedly mounted on said engine to generate a second train of voltage pulses in synchronism with the rotation of said crankshaft and at a predetermined and fixed angular relationship thereto to provide

an ignition timing retarded from the maximum advance of said first ignition timing;

first conductor means to apply said first train of voltage pulses to the primary windings of said coil;

second conductor means to apply said second train of voltage pulses to the primary windings of said coil; and

switch means in said first and second conductor means whereby either said first or second train of voltage pulses can be applied to the primary windings of said coil.

3,971,351

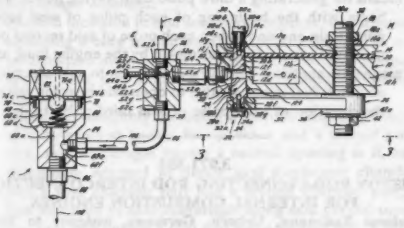
FUEL METERING SYSTEM

T. R. McKee, P.O. Box 127, Baytown, Tex. 77520

Filed Sept. 23, 1974, Ser. No. 508,448

Int. Cl.² F02B *33/00*

U.S. Cl. 123—119 R **7 Claims**



1. In an internal combustion engine having an exhaust manifold, a cylinder head with intake ports, a distributor, and a fuel pump, the improvement comprising a fuel metering system including:

a metering apparatus mounted with the fuel pump including:

a housing having a cavity formed therein, said cavity receiving pressurized fuel from the fuel pump;

a plurality of cam-actuated valving means in fluid communication with said cavity for distributing charges of fuel from said cavity at predetermined intervals;

exhaust gas mixing means mounted adjacent to said housing of said metering apparatus for mixing said charges of fuel with exhaust gas from the exhaust manifold to preheat and vaporize said charges of fuel, said exhaust gas mixing means having needle valve means for adjustably regulating the relative proportions of said charges of fuel with the exhaust gas from the exhaust manifold in proper ratios thereof;

fresh air mixing means mounted with said metering apparatus for mixing fresh air with said charges of fuel, said fresh air mixing means having a mixing housing having a mixing chamber formed therein for mixing said vaporized charge of fuel-exhaust gas mixture with fresh air, to provide a combustable charge of fuel directed to the intake ports with the cylinder head; and,

means for promoting ease of starting of the internal combustion engine and for providing the necessary boost for the internal combustion engine under high load conditions, said starting means mounted with said metering apparatus and the internal combustion engine.

3,971,352

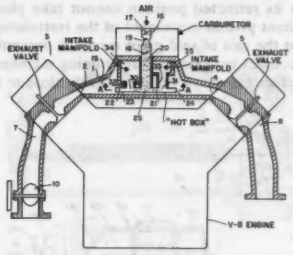
FUEL INDUCTION SYSTEM

Frederick J. Marsee, Clawson, Mich., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 439,912, Feb. 6, 1974, abandoned. This application Aug. 20, 1974, Ser. No. 498,960

Int. Cl.² F02M *31/00*

U.S. Cl. 123—122 AC **13 Claims**



1. An internal combustion engine having improved cylinder-to-cylinder fuel distribution enabling operation of said engine at lean air/fuel ratios with resultant decreased emission of hydrocarbon and carbon monoxide in the exhaust gas, said engine comprising the combination of a multicylinder spark-ignited internal combustion engine, intake manifold means for delivering air/fuel mixture to each of said multicylinders, carburetor means having means for atomizing gasoline into a carburetor barrel, an exhaust gas passage through which hot exhaust gas flows, an enclosed container defined by a bottom wall, side wall, and top wall having an inlet in said top wall and an outlet, said container being separate from said intake manifold, said container being located within said exhaust gas passage, first passage means connecting said carburetor barrel directly to said inlet to conduct all of said air/fuel mixture into said container, second passage means connecting said outlet to said intake manifold means to deliver said air/fuel mixture from said container into said intake manifold means; said first passage means, said container and said second passage means forming the only flow path for substantially all of said air/fuel mixture from said carburetor barrel into said intake manifold means.

3,971,353

BENDIX-TYPE ENGINE STARTER WITH MECHANICAL LOOKOUT TO PREVENT UNDESIRED STARTING OF ENGINE

Joseph R. Harkness, Germantown, and Robert Couchman, Jr., Menomonee Falls, both of Wis., assignors to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed Feb. 7, 1975, Ser. No. 548,162

Int. Cl.² F02H *3/00*

U.S. Cl. 123—179 K **11 Claims**

1. In combination with an engine starter of the Bendix-type wherein relative rotation in one direction between a driving pinion and a drive shaft with which it has a helically splined connection propels the driving pinion axially along the shaft into mesh with a ring gear on the flywheel of an engine with which the starter is associated and relative rotation in the opposite direction between the driving pinion and the shaft propels the driving pinion to a retracted position out of mesh with the ring gear, a mechanical lock-out adapted to be coupled to a remotely located control by which a function of the engine is activated, to prevent starting of the engine if said control has been actuated to activate said engine function, said lock-out comprising:

A. means providing a surface that is fixed with respect to the driving pinion, is substantially normal to its axis and faces

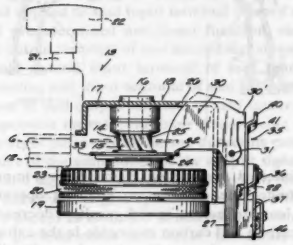
in the direction the pinion moves as it leaves its retracted position;

B. a rigid movable restraining member;

C. pivot means mounting said restraining member and constraining the same to pivotal movement in an arcuate path about an axis that is fixed with respect to the retracted position of the driving pinion,

a part of said rigid restraining member that is spaced from the axis of the pivot means being in contact with said surface so that axial movement of the driving pinion from its retracted position cannot take place if concomitant pivotal movement of the restraining member about the axis of said pivot means is prevented,

the contact between said restraining member and said surface being at a point relatively close to the axis of



the driving pinion and accommodating rotation of said surface;

D. a blocking member mounted to move along a path fixed with respect to the path of movement of said restraining member between an active position in which it blocks pivotal movement of the restraining member in the direction it must move for the driving pinion to leave its retracted position and an inactive position in which it does not interfere with such pivotal movement of the restraining member; and

E. motion transmitting means through which said blocking member is connectible with the remotely located control and by which the blocking member is moved to its active position concomitantly with actuation of the control to activate said engine function.

3,971,354

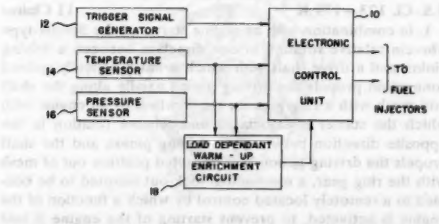
INCREASING WARM UP ENRICHMENT AS A FUNCTION OF MANIFOLD ABSOLUTE PRESSURE

David G. Luchaco, Rochester, and William A. Peterson, Jr., Troy, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed June 23, 1975, Ser. No. 589,174

Int. Cl.² F02B 3/00

U.S. Cl. 123—179 L **23 Claims**



1. In combination with an internal combustion engine fuel injection control system of the type having an electronic control unit to control the open time of at least one electrically actuated fuel injection valve in response to operating parameters of the engine, including the rotation of the engine's crank shaft, the engine's temperature and the engine's load, the improvement wherein said electronic control circuit comprises:

means for generating a first pulse train which produces a pulse for each revolution of said engine crankshaft, the magnitude of the pulses of said first pulse train varying in a predetermined manner;

means for generating a control signal having a predetermined fixed value for temperature above a predetermined temperature and a value variable as a function of engine temperature and engine load for engine temperatures below said predetermined temperature and engine load above a predetermined value;

means for generating a second pulse train which produces a pulse for each revolution of said engine crankshaft 180° out of phase with the pulses of said first pulse train, the magnitude of the pulses of said second pulse train varying as a function of said control signal;

means for combining the pulses of said first and second pulse trains so that the beginning of a pulse from said second pulse train terminates a pulse from said first pulse train and the end of a pulse from said second pulse train initiates a pulse from said first pulse train;

means for generating a third pulse train having pulses which begin with the beginning of each pulse of said second pulse train and ends when each pulse of said second pulse train reaches a value determined by the engine load; and

means for applying said third pulse train to said electrically actuated fuel injector valve to open said injector valve for the duration of each pulse of said third pulse train.

3,971,355

PISTON ROD-CONNECTING ROD INTERCONNECTIONS FOR INTERNAL COMBUSTION ENGINES

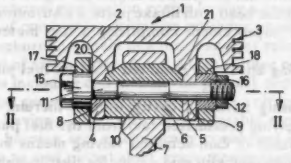
Helmut Kottmann, Urbach, Germany, assignor to Mahle GmbH, Stuttgart, Germany

Filed Sept. 4, 1974, Ser. No. 503,133

Claims priority, application Germany, Sept. 7, 1973, 2345223

Int. Cl.² F02B 75/32

U.S. Cl. 123—197 A **4 Claims**



1. A piston and piston rod arrangement for a reciprocating piston engine, said arrangement comprising:

a. a piston having a piston head, a piston ring portion and a pair of support members integral with said piston head and extending away from said piston head in spaced relationship with respect to the piston ring portion;

b. a connecting rod positioned between and in contact with said support members, said connecting rod being so shaped as to define a bore therethrough;

c. a piston rod carried on said connecting rod;

d. a bolt passing through said support members and through said bore to exert a clamping force between said support members and said connecting rod, the bolt having an intermediate portion which passes through said bore and which has a diameter less than that of said bore; and

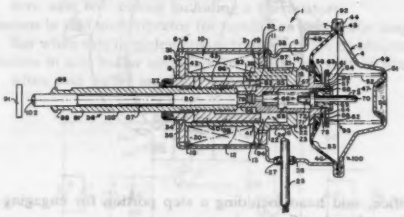
e. cooperating shoulders formed on said connecting rod and said support members to prevent movement of said connecting rod in a direction towards said piston head.

3,971,356

SOLENOID-DASHPOT

Robert E. Schlage, St. Charles, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Sept. 9, 1975, Ser. No. 611,823
Int. Cl.² F02B 77/00
U.S. Cl. 123—198 D 19 Claims



1. An integral solenoid and dash pot device for regulating the carburetor of an internal combustion engine comprising:

a housing, said housing defining a solenoid container and a diaphragm chamber;

a solenoid mounted in said solenoid container, said solenoid including a core having an axial opening through it, and an armature mounted for movement in the axial opening of said core, said armature having a longitudinal opening through it;

a diaphragm assembly including a flexible diaphragm movable between at least a first position and a second position, said diaphragm having a central opening in it, said diaphragm adapted to divide said diaphragm chamber into a first chamber part and a second chamber part; a hub mounted to said diaphragm along said central opening, said hub having a first end and a second end; a valve assembly mounted in the first end of said hub, said valve assembly arranged to permit communication between said first chamber part and said second chamber part upon a predetermined distance of travel of said diaphragm in a first direction, and to close communication between said first and said second chamber parts after a predetermined distance of travel of said diaphragm in a second direction; and

a shaft assembly movably mounted in said housing, said shaft assembly including a first shaft and a second shaft coaxially arranged with respect to one another, said second shaft being attached to said hub and said first shaft being adjustably connected to the armature of said solenoid.

3,971,357

METHOD AND APPARATUS FOR THROWING FRANGIBLE TARGETS

Jean-Michel LaPorte, and Jean-Claude LaPorte, both of Pont de la Brague, 06600 Antibes, France

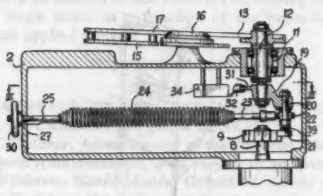
Filed Dec. 27, 1974, Ser. No. 536,989
Claims priority, application France, Jan. 2, 1974, 74.00018
Int. Cl.² F41B 3/04
U.S. Cl. 124—8 7 Claims

1. In a throwing device, said device comprising a pivotal shaft, a body which supports said pivotal shaft, a throwing arm mounted to a first end of said shaft and a crank mechanism affixed to a second end thereof, and a traction spring, said crank mechanism being mechanically coupled to the extendable end of said traction spring, the improvement comprising:

drive motor means for developing a force for positioning the throwing arm against the tension of the traction spring, said motor means including an electric motor having an output shaft;

means drivingly coupling said motor means motor output shaft to the pivotal shaft which mounts the throwing arm, said coupling means including a unidirectional clamping means, said clamping means restraining the pivotal shaft to rotation in a first direction only and thereby maintaining the pivotal shaft and the throwing arm in a position commensurate with the traction spring being under tension, said clamping means converting the kinetic energy of the traction spring to potential energy at the end of a throwing operation; and

control circuit means for said drive motor means, said control circuit means automatically de-energizing said drive



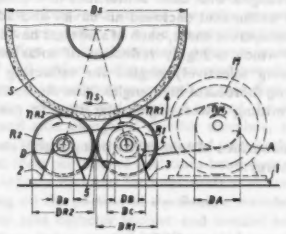
motor means motor after the throwing arm is spring driven to an overshoot position and locked, at which time said throwing arm is in a desired partially cocked spring tensioned position, and said control circuit means restarting said drive motor means motor whereby the pivotal shaft will be driven from the partially cocked spring tensioned position to an angular position wherein the throwing arm will be released to the influence of the traction spring acting on the crank mechanism for a throwing operation.

3,971,358

METHOD OF AND ARRANGEMENT FOR DRESSING OF GRINDING WHEELS

Wlodzimierz Sawluk, Hamburg, Germany, assignor to Ernst Winter & Sohn, Hamburg, Germany

Filed Apr. 29, 1974, Ser. No. 465,292
Claims priority, application Germany, Apr. 27, 1973, 2321477
Int. Cl.² B24B 53/14
U.S. Cl. 125—11 CD 15 Claims



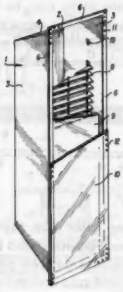
3. An apparatus for dressing and sharpening of grinding wheels, comprising mounting means mounting a grinding wheel for rotation at a predetermined peripheral speed; a pair of adjacent dressing rollers in contact with said grinding wheel; and drive means driving each of said dressing rollers at a peripheral speed different from the other and each being different from the predetermined peripheral speed of said grinding wheel and so that the dressing directions of said dressing rollers are mutually opposite and the dressing speeds are identical.

3,971,359

LOUVERED SELECTIVE SOLAR ENERGY COLLECTOR

Richard Curtis Bourne, 1820 B St., Lincoln, Nebr. 68502

Filed Apr. 14, 1975, Ser. No. 567,844
Int. Cl.² F24J 3/02
U.S. Cl. 126—270 5 Claims



1. An apparatus for heating air by solar heat, comprising:
an enclosed air cavity having an inlet for admitting air thereto, and an outlet for conducting air therefrom;
an outer transparent sheet which comprises an exterior wall of said cavity, which exterior wall is for transmission of solar energy,
an inner transparent sheet for transmission of solar energy spaced adjacent said outer transparent sheet and being substantially coextensive with said outer transparent sheet, the edges of said outer and inner transparent sheets being sealed together to isolate a volume of air therebetween,
a plurality of louvers comprising thin, substantially parallel slats, arranged with their centerlines in a plane which is located within said enclosed air cavity and adjacent the inner transparent sheet, each of said slats having an upper surface which is highly reflective of solar energy, said slats being selectively angled for reflecting solar rays impinging thereon at high angles from the horizontal, and for permitting lower angle solar rays to pass therebetween;
the interior surface of said cavity being highly absorptive of solar energy.

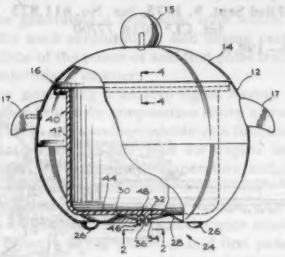
3,971,360

INSULATED SERVER

Carl R. Spoeth, Jr., Kewaskum, Wis., assignor to Dart Industries Inc., Los Angeles, Calif.

Filed Apr. 24, 1975, Ser. No. 571,150
Int. Cl.² B65D 25/14
U.S. Cl. 126—373 7 Claims

1. An insulated server having an outer housing with a top opening defined by a peripheral rim flange and a base portion having an orifice therethrough and support means for said server including a removable inner liner having a bottom and upstanding integral sidewalls, said bottom having an integral downwardly extending engagement means for releasable attachment to the base portion of said server comprising at least one projection with an enlarged head for passing through said



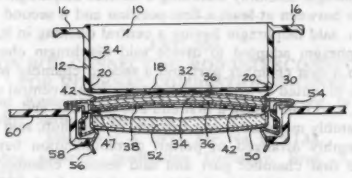
orifice, said head including a step portion for engaging the edges of said orifice.

3,971,361

LOW THERMAL MASS COOKING UTENSIL

Bohdan Hurko, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed July 15, 1974, Ser. No. 488,526
Int. Cl.² A47J 27/00
U.S. Cl. 126—390 19 Claims



1. A low thermal mass cooking utensil for surface cooking comprising generally raised side walls and a high temperature resilient plastic sheet that is stretched taut and sealed across the bottom edge of the side walls to form a leak-proof bottom wall, so that the weight of the cooking load placed in the utensil will cause the bottom wall to stretch and conform to the top surface of a supporting surface heating means for good thermal coupling, and the principle manner of applying heat to the utensil is by thermal conduction through the resilient bottom wall.

3,971,362

MINIATURE INGESTIBLE TELEMETER DEVICES TO MEASURE DEEP-BODY TEMPERATURE

Jack M. Pope, and Thomas B. Fryer, both of Saratoga, Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 27, 1972, Ser. No. 301,418
Int. Cl.² A61B 5/07
U.S. Cl. 128—2 P 8 Claims

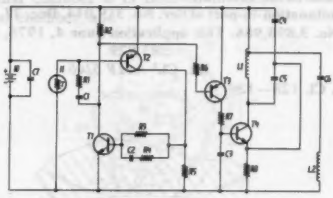
1. A miniature, ingestible telemeter device for transmitting information relating to deep-body temperature of a subject comprising:
a free-running multivibrator having complementary transistors;
an r-f oscillator having a predetermined resonant frequency, said oscillator including an inductor for radiating r-f energy;
a buffer amplifier coupled between said multivibrator and said oscillator;

a battery connected to said multivibrator, said buffer amplifier, and said oscillator;

said free-running multivibrator having temperature-sensitive circuit means for turning on and off said multivibrator and controlling its output pulse frequency when in the on state, said temperature-sensitive circuit means comprising an R-C circuit, said R-C circuit being connected to said battery and to both of said complementary transistors, said R-C circuit including a thermistor;

means in said multivibrator for turning on said buffer amplifier when said complementary transistors are conducting;

means in said buffer amplifier for turning on said oscillator when said buffer amplifier is on;

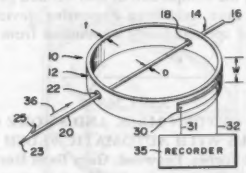


said multivibrator, said buffer amplifier and said r-f oscillator being in an off state and drawing an insignificant current from said battery when said thermistor is subjected to or below a predetermined temperature which is below the deep-body temperature of the subject ingesting said telemeter device, said free-running multivibrator, said buffer amplifier, and said r-f oscillator being in an on state whenever said thermistor is exposed to a temperature above said predetermined temperature, the output frequency of said multivibrator being proportional to the temperature of said thermistor, said oscillator generating bursts of r-f energy at the output frequency of said multivibrator, the period between successive bursts being inversely proportional to the temperature of said thermistor.

3,971,363
MYOCARDIUM WALL THICKNESS TRANSDUCER AND MEASURING METHOD

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Cyril Feldstein, Sierra Madre, Calif.; Gilbert W. Lewis, Arcadia, Calif.; Robert H. Silver, Van Nuys, Calif., and Virgil H. Culler, La Canada, Calif.

Filed May 5, 1975, Ser. No. 574,218
Int. Cl.² A61B 5/10
U.S. Cl. 128—2 S **10 Claims**



1. A transducer for measuring changes in thickness of a material, comprising:

a closed loop shaped beam of high elastic compliance, said beam defining an opening therein;

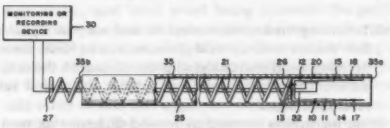
an elongated rod-shaped spike of a diameter less than the diameter of said opening, said spike having a portion extending into said loop through said opening and being connected to said beam at a point substantially opposite said opening, said spike further including a working portion extending outwardly from said opening and terminating in a tapered end, the working portion of said spike being adapted to be inserted in a material, whose thickness change is to be measured, through an exposed surface of said material, to a depth so that said exposed surface is in intimate contact with the portion of the beam around said opening, with said material applying a minimal beam-deforming force to said beam; and

strain gauge means including a strain gauge bonded to said beam between said opening and the point at which said spike is connected to said beam for measuring changes in the beam strain as a function of the beam-deforming forces applied thereto.

3,971,364
CATHETER TIP FORCE TRANSDUCER FOR CARDIOVASCULAR RESEARCH

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Cyril Feldstein, Sierra Madre; Gilbert W. Lewis, Arcadia; Robert H. Silver, Van Nuys, and Virgil H. Culler, La Canada, all of Calif.

Filed May 16, 1975, Ser. No. 578,241
Int. Cl.² A61B 5/10
U.S. Cl. 128—2 S **9 Claims**



1. A transducer for measuring forces in an internal muscle of a living subject without surgical intervention comprising:

first means including a plurality of substantially parallel spaced apart tines with tapered outer ends for penetrating an internal muscle of a subject;

strain gauge means coupled to said first means to provide an output related to the low compliance deflection of one of said tines;

an elongated flexible member having a first end coupled to said first means remote from said tines and extending to a second end; and

an elongated flexible hollow tube, definig a catheter, having a first working end and an opposite second end, said catheter being adapted to be inserted into said subject so that its first end is substantially adjacent an internal muscle of said subject and the second end remaining external thereof, said catheter surrounding said first means with the tines adjacent and directed toward the catheter first end, and said elongated flexible member, except for a portion thereof, extending beyond said catheter second end, at least portions of said tines being extractable from said catheter first end for implantation in said muscle by pushing on the portion of the flexible member extending beyond said catheter second end toward said catheter, said tines being retractable from said muscle into said catheter through the first end thereof by pulling on the portion of the flexible member extending beyond said catheter second end.

3,971,365
BIOELECTRICAL IMPEDANCE MEASURING SYSTEM

Leland B. Smith, Arlington Heights, Ill., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Feb. 12, 1973, Ser. No. 331,770
Int. Cl.² A61B 5/05
U.S. Cl. 128—2.1 Z **8 Claims**

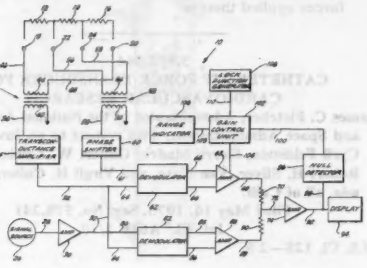
1. A bioelectrical impedance measuring system comprising

excitation electrode means adapted to be associated with a subject exhibiting impedance to be measured, for coupling a high frequency excitation signal to the subject;

receiver electrode means adapted to be associated with the subject for receiving a subject output signal developed in response to the excitation signal;

subject signal amplifier means connected to said receiver electrode means for developing a d.c. output signal proportional to the subject output signal;

reference amplifier means adapted to be connected to the source of the high frequency excitation signal for developing a d.c. reference signal from the excitation signal;



differencing means connected to said subject signal amplifier means and to said reference amplifier means for deriving a difference signal proportional to the amplitude difference between said d.c. subject signal and said d.c. reference signal;

detecting means connected to said differencing means for detecting a nulled condition of said difference signal;

gain control means for adjusting and stabilizing the gain of said subject signal amplifier means with said difference signal in a nulled condition; and

display means connected to said differencing means responsive to said difference signal.

3,971,366

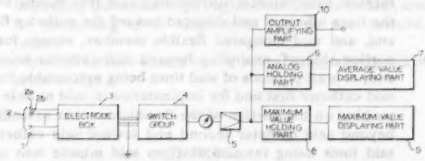
APPARATUS AND METHOD FOR MEASURING THE CONDITION OF THE MERIDIANS AND THE CORRESPONDING INTERNAL ORGANS OF THE LIVING BODY

Hiroshi Motoyama, 4-11-7, Inokashira, Mitaka, Tokyo, Japan

Filed Nov. 25, 1974, Ser. No. 527,150

Int. Cl.[2] A61B 5/04

U.S. Cl. 128—2.1 Z **5 Claims**



1. A visceral/automatic nervous function diagnosing apparatus comprising a reference electrode which is firmly attachable to a part of the living body, a plurality of differential electrodes firmly attachable to 14 pairs of specific minute points at the finger tips of the hands and feed of the living body, detecting circuit means to which said electrodes are connected for detecting electric resistance in the surface layer of the living body generated between said reference electrode and the respective differential electrodes and having a switching means for switching the connection between said reference electrode and respective differential electrodes, a maximum value measurement means connected to said detecting circuit means for obtaining a maximum value of the output of said detecting circuit means, an average value measurement means connected to said detection circuit means for obtaining an average value of the output of said detecting circuit means, and comparison and displaying means for comparing the maximum value and the average value and for displaying the results obtained from the comparison.

3,971,367

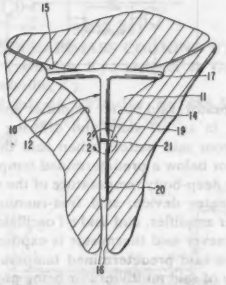
INTRAUTERINE DEVICE HAVING MEANS FOR CHANGING FROM UTERINE-RETENTIVE SHAPE TO NONUTERINE-RETENTIVE SHAPE

Alejandro Zaffaroni, Atherton, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 319,014, Dec. 27, 1972, Pat. No. 3,898,986. This application June 4, 1975, Ser. No. 583,829

Int. Cl.[2] A61F 5/46

U.S. Cl. 128—130 **23 Claims**



1. A drug dispensing intrauterine device, shaped and adapted for insertion and positioning in the uterine cavity, with the device comprising in combination:

a. a drug

b. a delivery means adapted for insertion into the uterine cavity and for dispensing a therapeutically effective amount of drug to the uterine cavity over a defined period of time, and

c. retention means for retaining the delivery means within the uterine cavity throughout the defined period of drug dispensing time, said retention means having an initial unit structural configuration sahped and adapted for insertion and positioning in the uterine cavity including means formed of a member selected from the group consisting of protein, collagen, elastin, keratin, resilin and fibrin that undergo biotransformation in the uterine cavity to a different and nonuterine-retentive configuration whereby at the completion of said defined period of drug dispensing time, said drug dispensing device is facilely removed or spontaneously eliminated from the uterine cavity.

3,971,368

COMBINED OXYGEN MASK AND SMOKE GOGGLE APPARATUS WITH AUTOMATIC FLUSH VALVE

Robert Stafford Forbes, Leawood; Gary Dean Herrick, Olathe, and Robert Julius Richter, Overland Park, all of Kans., assignors to Puritan Equipment, Inc., Lenexa, Kans.

Filed Aug. 13, 1975, Ser. No. 604,465

Int. Cl.[2] A62B 7/00

U.S. Cl. 128—142 R **6 Claims**

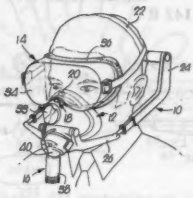
1. In protective breathing and vision maintenance apparatus;

breathing mask means having a face-piece adapted to fit over the nose and mouth area of the face of a user to present a first chamber between said mask means and the

face of the user, said mask means including inlet means through which breathable gas under pressure may be supplied to said first chamber;

goggle means adapted to fit over the eyes area of the face of a user and to present a second chamber between said goggle means and the face of the user;

conduit means adapted for placing said chambers in fluid communication with each other for the passage of gas from said first chamber into said second chamber said goggle means including means for operably engaging said conduit means for displacing the latter from a first position, in which said first chamber is not in fluid communication with said second chamber, to a second position in response to the positioning of said goggle means, in which said first chamber is in fluid communication with said second chamber; and



valve means operably associated with said conduit means for opening and closing the latter for the passage of said gas from said first chamber into said second chamber, whereby said valve means is opened in response to the displacement of said conduit means into said second position and closed in response to the displacement of said conduit means into said first position, and

whereby gas under pressure will automatically be supplied from said first chamber to said second chamber to flush out said goggle means when the latter are in place on the face of the user, but said first chamber will be substantially sealed by the closing of said valve means to conserve said gas when said goggle means are not in place on the face of the user.

3,971,369

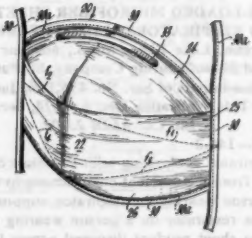
FOLDED CUP-LIKE SURGICAL FACE MASK AND METHOD OF FORMING THE SAME

Gary B. Aspelin, Bridgewater, and James T. Smith, Edison, both of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed June 23, 1975, Ser. No. 589,721

Int. Cl.² A61M *16/00*

U.S. Cl. 128—146.2 **22 Claims**



12. A generally cup-like face mask comprising a body portion and means for holding the mask in place over the nose and mouth of a wearer, said body portion comprising a filtration medium for filtering bacteria and being folded from a blank of said filtration medium, said blank in its unfolded form having top and bottom edges and a pair of opposed side edges, said blank having established thereon;

1. **a longitudinal fold line running from top to bottom thereof;**
2. **a first transverse line of demarcation, said first line being substantially parallel to the top and bottom edges of said blank and extending from side to side thereof;**
3. **a second transverse line of demarcation extending from side to side of said blank, said second line being between, and generally parallel to, said first transverse line and one of said top and bottom edges of the blank;**
4. **a third transverse line of demarcation extending from side to side of said blank, said third line being between, and generally parallel to, said first transverse line and the other of said top and bottom edges of the blank;**
5. **first and second points on one of said side edges of said blank, said first point being between the point at which said second transverse line of demarcation meets said one of said side edges and said one of said top and bottom edges, said second point being between the point at which said third transverse line of demarcation meets said one of said side edges and said other of said top and bottom edges, the distance between szid first point and said second transverse line of demarcation, and the distance between said second point and said third transverse line of demarcation being not greater than the distance between said second line of demarcation and said third line of demarcation;**
6. **third and fourth points on the other of said side edges of said blank, said third point being between the point at which said second transverse line of demarcation meets said other of said side edges and said one of said top and bottom edges, said fourth point being between the point at which said third transverse line of demarcation meets said other of said side edges and said other of said top and bottom edges, the distance between said third point and said second transverse line of demarcation, and the distance between said fourth point and said third transverse line of demarcation being not greater than the distance between said second line of demarcation and said third line of demarcation;**
7. **four angularly disposed fold lines, one of said four fold lines connecting said first point with a fifth point on said longitudinal fold line;**

a second of said four fold lines connecting said second point with a sixth point on said longitudinal fold line;

a third of said four fold lines connecting said third point with said fifth point on said longitudinal fold line;

and the last of said four fold lines connecting said fourth point with said sixth point on said longitudinal fold line, provided, however, that none of said four fold lines meets said longitudinal fold line at that portion of said longitudinal fold line lying between said second transverse line of demarcation and said third transverse line of demarcation, and further provided that the distance between the intersection of said longitudinal fold line with said second transverse line of demarcation and said fifth point does not exceed about 75% of the distance between said first and second transverse lines of demarcation and the distance between the intersection of said longitudinal fold line with said thrid transverse line of demarcation and said sixth point does not exceed about 75% of the distance between said first and said third transverse lines of demarcation;

said blank being creased along said longitudinal fold line;

said first and second points being located, when said blank is in its folded configuration, on said one of said side edges at positions lying between said second said third transverse lines of demarcation;

and said third and fourth points being located, when said blank is in its folded configuration, at positions on said other of said side edges at positions lying between said second and said third transverse lines of demarcation, said folded blank being secured at the sides thereof

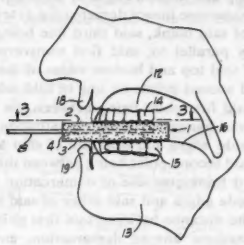
whereby its cup-shaped configuration is retained.

3,971,370

TONGUE AND JAW POSITIONING ARTICLE

George C. Halford, and Robert E. Michael, both c/o Halbrand, P.O. Box 272, Willoughby, Ohio 44094

Filed Oct. 30, 1969, Ser. No. 872,499
Int. Cl.[2] A61F 5/56
U.S. Cl. 128—136 5 Claims



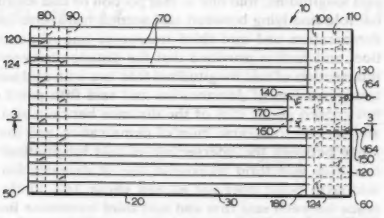
1. In a tongue and jaw positioning article of the class described, in combination, a block of relatively dense, rigid plastic foam for inserting in the mouth of a subject, said block being approximately the width of the tongue of such subject and a length to substantially overlie such tongue, said block extending between and outwardly of the teeth of the upper and lower jaws of such subject when emplaced therebetween, the thickness and density of the block normally preventing the teeth of such subject from penetrating the block to any substantial depth, and the teeth of such upper and lower jaws from interengaging when the block is in the position described, and a strip of much harder relatively thin and non-yieldable material, fixed in said block extending over a substantial portion of the area of the block whilst being confined therein, one end of said strip extending outwardly from the block to form a handle.

3,971,371

URINE-SENSING PAD

Stanley Bloom, 1048 Kenyon Ave., Plainfield, N.J. 07060

Filed May 27, 1975, Ser. No. 580,776
Int. Cl.[2] A61B 19/00
U.S. Cl. 128—138 A 5 Claims



1. A pad for electrically detecting the presence of a conductive fluid comprising

a sheet of insulating material having top and bottom surfaces and first and second ends,

a plurality of parallel fluid-sensing strips of conductive material on the top surface of said sheet including first, second . . . *n* strips,

a first connecting strip connected to the odd-numbered fluid-sensing strips which are thus connected in a common first set,

a second connecting strip connected to the even-numbered fluid-sensing strips which are thus connected in a common second set,

said first and second connecting strips being on the bottom surface of said sheet, and

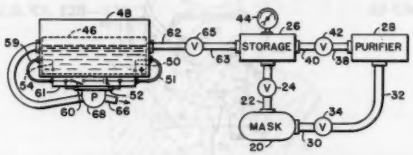
metal staples making the connections between the fluid-sensing strips and their connecting strips through said sheet.

3,971,372

OXYGEN-GENERATING APPARATUS FOR SCUBA DIVING

Ronald J. Lenk, 8919 Eldora Drive, and David T. Fletcher, 3773 Belfast St., both of Cincinnati, Ohio 45236

Filed May 29, 1975, Ser. No. 581,716
Int. Cl.[2] A62B 7/00
U.S. Cl. 128—142 R 11 Claims



1. Underwater oxygen-generating apparatus for supplying oxygen for an underwater swimmer, said apparatus including an electrolytic oxygen generator adapted to be carried by the swimmer, said generator comprising:

a closed insulated container for containing an electrolytic solution;

mounting means for rotatably mounting said container for rotation on a normally horizontal axis, the center of gravity of said container being radially spaced from said axis, whereby said container rotates as said mounting means rotates on said horizontal axis;

a first anode electrode and a second cathode electrode mounted in said container and spaced from each other, said electrodes being oriented radially in the direction of said center of gravity, whereby said electrodes are normally maintained in a vertical orientation as said mounting means is rotated on said horizontal axis and wherein hydrogen gas forms at said cathode electrode and oxygen gas forms at said anode electrode;

means for connecting a two-terminal source across said electrodes; means for electrical insulating said connecting means from the surrounding environment; and

a collector means at each electrode for collecting the gases generated thereat and for exiting the gases from said generator.

3,971,373

PARTICLE-LOADED MICROFIBER SHEET PRODUCT AND RESPIRATORS MADE THEREFROM

David L. Braun, Lake Elmo, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 435,198, Jan. 21, 1974, abandoned. This application Dec. 6, 1974, Ser. No. 530,070
Int. Cl.[2] A62B 23/02
U.S. Cl. 128—146.2 24 Claims

21. A respirator comprising inlet structure defining a path of air intake from the ambient environment to the mouth and nose of a person wearing the respirator, support structure for mounting the respirator on a person wearing the respirator, and a porous sheet product disposed across the path of air intake so as to filter air drawn into the respirator, said sheet product comprising a web of entangled melt-blown organic polymeric microfibers and a three-dimensional array of solid particles dispersed and physically held in the web, the only contact between the microfibers and particles being the point contact of preformed solid bodies, whereby essentially the full

surface of particles is exposed for interaction with a fluid passing through the sheet product.

3,971,374

SYMMETRIC PADDED BANDAGE FOR INJURED PALM OF EITHER HAND

William H. Wagner, 5405 W. Eva St., Glendale, Ariz. 85301

Filed May 5, 1975, Ser. No. 574,683
Int. Cl.² A61F 13/00
U.S. Cl. 128—155 6 Claims

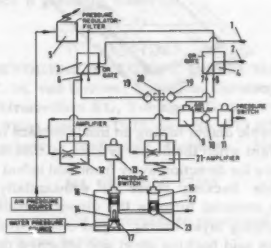
1. A bandage suitable for protecting an injured palm of either a right or a left hand which comprises a sheet of wrapping material coated adhesively on its inner surface for adhesion to the skin and comprising a central area to cover the hollow part of the hand and plural pairs of tabs extending more or less radially from said central area, each pair of said tabs being arranged substantially symmetrically with respect to an axis aligned along the wrist and between the third and fourth fingers, one pair of said tabs being positioned to engage respectively the little finger and the index finger of a right hand or alternatively the index finger and little finger of a left hand, and a protective pad secured to the sheet in position to cover and protect said injured palm, the tabs being sufficient in number and so arranged as to hold said pad against said palm in either open or relatively closed conditions of the hand.

3,971,375

DENTAL SYRINGE

Horace Kirby Hill, London, England, assignor to The Amalgamated Dental Company Limited, London, England

Filed Apr. 17, 1975, Ser. No. 569,329
Claims priority, application United Kingdom, Apr. 19, 1974, 17333/74
Int. Cl.² A61M 11/00
U.S. Cl. 128—173.1 10 Claims



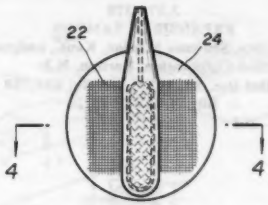
1. A dental syringe comprising a hand held syringe unit coupled to a control unit, the hand held syringe unit being formed with an air control aperture and a water control aperture, the control unit comprising an air pressure regulator intended to be connected to an air pressure source and arranged to produce a regulated air pressure output, an air control fluid gate having a control input connected to the air control aperture in the syringe unit, a fluid input connected to the output of the air pressure regulator and a fluid output, the regulated air pressure being fed to the fluid output of the air control fluid gate only when the air control aperture is covered, an air control valve having a control input connected to the output of the air control fluid gate, an air input intended to be connected to the air pressure source, and an air output connected to an output nozzle in the syringe, the arrangement being that, when the regulated pressure appears at the output of the air control fluid gate, the air pressure source is connected to the said nozzle, a water control fluid gate having a control input connected to the water control aperture in the syringe unit, a fluid input connected to the output of the air pressure regulator, and a fluid output to which the regulated air pressure is fed only when the water control aperture is covered, and a water control valve having a water input intended to be connected to a water pressure source, a water output connected to the said nozzle and a control input connected to the fluid output of the water control fluid gate.

3,971,376

METHOD AND APPARATUS FOR INTRODUCING FLUIDS INTO THE BODY

Otto Wichterle, Prague, Czechoslovakia, assignor to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Continuation-in-part of Ser. No. 335,745, Feb. 26, 1973, abandoned. This application Oct. 2, 1974, Ser. No. 511,428
Int. Cl.² A61M 7/00
U.S. Cl. 128—260 8 Claims



1. Apparatus for supplying fluids in an interior body organ comprising a capsule adapted to be implanted subcutaneously for extended periods of time said capsule having unitary walls formed of substantially non-collapsable self-sealing elastic material penetrable by injection and defining an enclosed bulbous interior cavity of given volume for receipt of fluid, said walls being formed of a hydrophillic elastic gel of sufficient strength to retain its shape and maintain a constant volume during periodic filling and emptying and reseal itself under penetration by injection feeding while implanted, said capsule having a channel exiting therefrom for connection to a conduit for the feeding and withdrawal of fluids to some body organ.

3,971,377

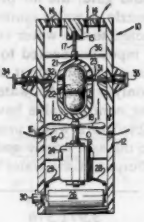
MEDICAMENT DISPENSING PROCESS FOR INHALATION THERAPY

Nalinkant C. Damani, Mountain View, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Continuation of Ser. No. 477,990, June 10, 1974, which is a division of Ser. No. 409,243, Oct. 24, 1973, Pat. No. 3,831,606, which is a continuation of Ser. No. 117,015, Feb. 19, 1971, abandoned. This application July 21, 1975, Ser. No. 597,568
The portion of the term of this patent subsequent to Aug. 27, 1991, has been disclaimed.
Int. Cl.² A61M 15/08, 13/00
U.S. Cl. 128—266 8 Claims

1. A process of dispensing medicament for inhalation by a patient comprising:

a. providing a hollow elongate housing having air inlet and air outlet passages;
b. mounting a closed container of medicament within the housing on a fixed axis of rotation;
c. opening said container;
d. operating an internal rotation producing means to generate a positive pressure air stream between the air inlet and the air outlet to discharge the air stream from the outlet;



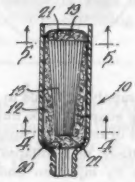
e. rotating the container of medicament about said axis within the housing by said rotation producing means;
f. dispensing a dosage of medicament from the container into the airstream while the container is rotating; and
g. inserting the air outlet passage into the oral or nasal cavity of the patient.

3,971,378

EXPANSIBLE TAMPON

Kermit E. Krantz, Shawnee Mission, Kans., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Dec. 20, 1974, Ser. No. 534,758
Int. Cl.² A61F 13/20
U.S. Cl. 128—285 29 Claims



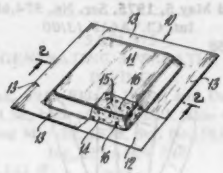
1. A tampon comprising: an axially elongated, unitary absorbent member adapted to be inserted into the vagina with the leading end facing the cervix and disposed in close proximity thereto and the trailing end facing the exterior of the vagina, said trailing end being disposed in axial alignment with said leading end, axially elongated spreader means disposed within and surrounded by said unitary absorbent member for expanding said absorbent member from a compressed position for insertion of the tampon into the vagina to a relaxed position which is assumed after insertion of the tampon into the vagina, said spreader means having a leading end facing the leading end of the absorbent member and a trailing end facing the trailing end of the absorbent member, the trailing end of the spreader means being disposed in axial alignment with the leading end thereof, the lateral extent of the leading end of the absorbent member being approximately equal to the lateral extent of the trailing end of the absorbent member in the compressed position, and the lateral extent of the leading end of the absorbent member being larger than the lateral extent of the trailing end of the absorbent member in the relaxed position, said tampon adapted to expand and conform to the shape of the most distensible portion of the vagina upon insertion of said tampon therein, said tampon being sufficiently absorbent so as to be adapted for use in a post partum woman.

3,971,379

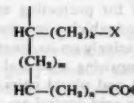
ABSORBENT HYDROPHILIC CELLULOSIC PRODUCT

Pronoy Kumar Chatterjee, Spotswood, N.J., assignor to Personal Products Company, Milltown, N.J.

Filed Apr. 4, 1975, Ser. No. 565,294
Int. Cl.² A61F 13/20
U.S. Cl. 128—285 15 Claims



1. An absorbent body comprising hydrophilic crosslinked cellulose, said cellulose being crosslinked with an oxygen atom of a hydroxy group in an anhydroglucose unit of one cellulose molecule linked to an oxygen atom of a hydroxy group in an anhydroglucose unit of a second cellulose molecule through a crosslinking radical having the structure:



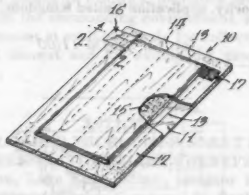
where X is chosen from the group consisting of H or COOY; Y is chosen from the group consisting of Na, K, Li, Ce, or H; and k, m and n are integers ranging from 0 to 4.

3,971,380

DISPOSABLE DIAPER HAVING AN ADHESIVE CLOSURE SYSTEM AND METHOD OF CONSTRUCTION THEREFOR

Ludwig Tritsch, Wilmette, Ill., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed May 19, 1975, Ser. No. 578,556
Int. Cl.² A61F 13/16
U.S. Cl. 128—287 3 Claims



1. A disposable diaper having an inside surface for direction toward an infant when the diaper is worn by that infant and an outside surface for direction away from said infant and including a flexible backing sheet of substantially moisture-impermeable material forming the diaper outside surface, a moisture-retaining layer having a pad of absorbent material superposed on said backing sheet and attached thereto and a porous facing sheet substantially coextensive with said backing sheet and forming the diaper inside surface, and a pressure sensitive adhesive closure within the peripheral limits of the diaper and comprising a layer of anchoring adhesive between said backing sheet and said facing sheet at a marginal location on said diaper and adhesively attached both to said backing sheet and to said facing sheet and a layer of pressure sensitive securing adhesive on said facing sheet, substantially coexten-

sive with said layer of anchoring adhesive and adhesively attached to said anchoring adhesive through said facing sheet and presenting a tacky surface in the same direction as the diaper inside surface; said anchoring adhesive layer having greater adhesion to the backing sheet than said securing adhesive layer, and said securing adhesive layer having a greater quick stick property relative to the backing sheet than said anchoring adhesive layer.

3,971,381

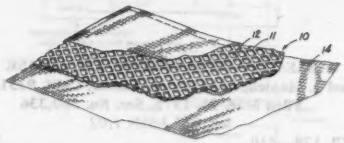
LAPAROTOMY SPONGE

Robert T. Gibson, Andrews, N.C., assignor to Professional Surgical Manufacturing Company, Marietta, Ga.

Filed Feb. 19, 1975, Ser. No. 551,134

Int. Cl.² A61F *15/00, 13/00*

U.S. Cl. 128—296 **6 Claims**



1. A laparotomy sponge comprising a filler consisting essentially of rayon and polypropylene fibers mixed together in a weight ratio of approximately 80% rayon and 20% polypropylene and shaped into a configuration having a waffled surface; and a foraminous cover secured about said filler.

3,971,382

METHOD OF NON-SURGICAL TREATMENT OF CATARACTS

Mikhail Mikhailovich Krasnov, ulitsa Vesnina, 30, kv. 12, Moscow, U.S.S.R.

Continuation of Ser. No. 423,749, Dec. 11, 1973, abandoned. This application Nov. 22, 1974, Ser. No. 526,311

Int. Cl.² A61B *17/36*

U.S. Cl. 128—303.1 **5 Claims**

1. A method of non-surgical treatment of soft and membraneous cataracts, including congenital cataracts, said method comprising the step of cutting the anterior capsule of the lens and/or pupillary membrane without perforating injury to the eye wall with a laser beam caused to pass through the cornea, the anterior chamber of the eye and the pupil, and then be focused onto the anterior capsule of the lens and/or pupillary membrane to thus form at least one hole through which the cataract substance is thus let out of the lens capsule/soft cataract/into the anterior chamber of the eye where the substance is gradually dissolved.

3,971,383

CRYOGENIC SURGICAL INSTRUMENT

Johannes T. M. van Gerven, Tubingen, Germany, assignor to Erbe Elektromedizin KG, Tubingen, Germany

Filed Apr. 29, 1975, Ser. No. 572,872

Claims priority, application Germany, May 7, 1974, 2422103

Int. Cl.² A61B *17/36*

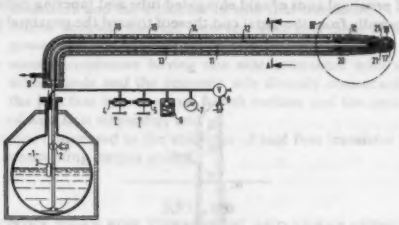
U.S. Cl. 128—303.1 **10 Claims**

1. Cryogenic surgical instrument to supercool limited areas of biological tissue having

a hollow tip (21) of thermally conductive material, a supply vessel (1) of supercooled cryogenic liquid,

a supply line (11) connected to said supply vessel (1) and to the hollow interior of the tip (21),

a return line coaxial with said supply line and surrounding the same, said return line comprising two coaxial tubes (13, 15) spaced from each other and defining a heat-insulating space (14) therebetween, the inner one of the coaxial tubes (13) being spaced from the supply line (11) to define a return space (12) for evaporated cryogenic liquid,



and a filler material comprising n-butane in said insulating space (14).

3,971,384

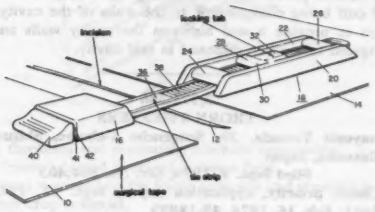
SURGICAL CLOSURE

Harrith M. Hasson, 6942 N. Waukesha Ave., Chicago, Ill. 60646

Continuation-in-part of Ser. No. 123,559, March 12, 1971, Pat. No. 3,698,395. This application Dec. 17, 1971, Ser. No. 209,165

Int. Cl.² A61B *17/08*

U.S. Cl. 128—335 **7 Claims**



1. A surgical closure which comprises: a first surgical tape member for application to one side of an incision; a second surgical tape member for application to the other side of the incision; said first surgical tape member carrying a tie strip anchor and said second surgical tape member carrying a tie strip slide, said tie strip slide defining a slot to receive a tie strip and including a locking member; and a tie strip for sliding through said tie strip slide for coupling said first and second surgical tape members; at least a portion of said locking member being spaced, from the surface on which the tie strip lies, a distance that is smaller than the thickness of the tie strip, whereby said locking member can cooperate with said tie strip to maintain said tie strip within said tie strip slide; and further including a plurality of said surgical closures in a connected assembly, said connected assembly comprising tear strip means separating each surgical closure.

3,971,385

MEDICAL TUBE WITH CUFF

Joseph H. Corbett, Glen Falls, N.Y., assignor to Sherwood Medical Industries Inc., St. Louis, Mo.

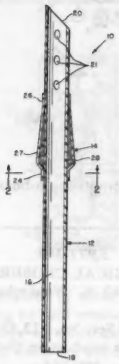
Filed Sept. 9, 1974, Ser. No. 504,204

Int. Cl.² A61M *25/00*

U.S. Cl. 128—351 **13 Claims**

1. A medical tube insertable into a body cavity comprising an elongated tube for effecting fluid communication with the body cavity, a preformed cuff of smooth, pliable material connected to said tube in surrounding relation therewith and including proximal and distal portions sealingly connected to

said elongated tube and a balloon portion between said proximal and distal portions spaced radially from said elongated tube, said balloon portion being axially spaced from the distal and proximal ends of said elongated tube and tapering radially outwardly from the distal end thereof toward the proximal end



thereof, and a substantially nonporous, homogenous gel filling said balloon portion and conforming to the shape of said cuff, said cuff being conformable to the walls of the cavity it engages to provide a seal between the cavity walls and said elongated tube when disposed in said cavity.

3,971,386

THORN TWEEZERS

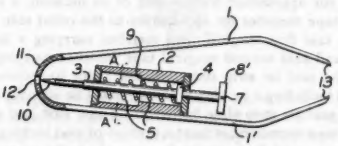
Masayoshi Yamada, 39, Sengencho 1-chome, Shizuokashi, Shizuoka, Japan

Filed Sept. 9, 1974, Ser. No. 504,403

Claims priority, application Japan, Sept. 11, 1973, 48-102461; Feb. 16, 1974, 49-18893

Int. Cl.² A61B *17/30*

U.S. Cl. 128—354 **1 Claim**



1. A thorn tweezer comprising an elongated resilient U-shaped member having a generally U-shaped end portion and a pair of opposed elongated shanks extending from said U-shaped end portion, said U-shaped end portion having an opening, said shanks having opposed terminating ends, said shanks being adapted to be manually compressed to move said opposed terminating ends towards one another to thereby grasp a thorn or splinter disposed therebetween, each of said shanks having an inner face which face opposite one another, a cylinder fixedly mounted on the inner face of one of said shanks such that said cylinder is disposed between said pair of elongated shanks, a needle having a point, means slidably mounting said needle in said cylinder for movement between an extended position in which the point of said needle extends beyond said U-shaped end portion of said resilient U-shaped member and a retracted position wherein the point of said needle is disposed within the longitudinal ends of said resilient U-shaped member, said needle passing through said opening in said U-shaped end portion when said needle is in said extended position, a laterally extending lever on said needle, a spring in said cylinder urging said needle into its retracted position, means on said cylinder adapted to be engaged by said lever to retain said needle in said extended position, said needle when in said extended position being operable to effect removal of a thorn or splinter from a person's body as the resilient U-shaped member functions as a handle to facilitate manipulation of said needle, said needle when in said retracted position being protected by said resilient U-shaped member to prevent injuries, said shanks of said resilient U-shaped member being adapted to be grasped by a user to move said terminating ends closer to one another independently of the movement of said needle between its retracted and extended positions, whereby the operation of said resilient U-shaped member and the operation of extending retracting said needle may be effected independently.

3,971,387

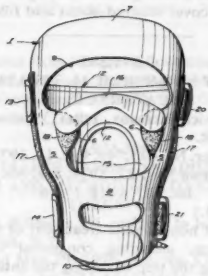
ELECTRO-THERAPEUTIC FACE MASK

Michael J. Mantell, 5334 Linley, Encino, Calif. 91316

Filed Mar. 21, 1975, Ser. No. 560,336

Int. Cl.² A61N *1/02*

U.S. Cl. 128—410 **5 Claims**



1. A therapeutic face mask for use with moisturized padding previously applied to the face of the user, comprising:

a. a normally flat flexible face mask member having an opening for exposing the eyes and nose of the user surrounded by cheek covering portions, a forehead covering portion, a jaw covering portion and a pair of side margins at the outer edges of the cheek covering portions;

b. a plurality of electrically conductive contact buttons carried by the mask on one side thereof for electrical contact with the moistened padding and conductor means for connecting all said buttons to a source of electrical energy;

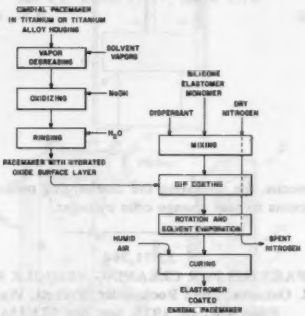
c. a normally flat retainer member including a head strap and a neck strap;

d. and a plurality of separable fastener means for variably connecting said retainer member to said mask member, each including a fastener strip extending along a side margin, and mating fastener strips extending longitudinally of one of the end portions of each strap, the fastener strips being adapted for variable connection to secure the mask member in position to effect multiple electrical connections between the buttons and the padding.

3,971,388
TITANIUM COVERED CARDIAC PACEMAKER WITH ELASTOMER COATING AND METHOD OF APPLYING SAME

David J. Cowdery, Elanora, Australia, assignor to Telectronics Pty. Limited, Australia

Filed Nov. 29, 1974, Ser. No. 528,091
Int. Cl.² A61N 1/36
U.S. Cl. 128—419 P 8 Claims

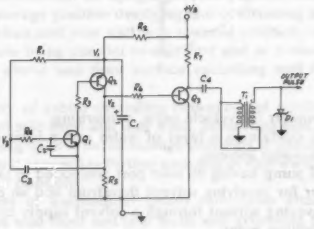


1. A method of applying a flexible silicone elastomer to an implantable heart pacemaker enclosed within a housing formed of a material from the group including titanium and titanium alloys comprising dispersing a silicone elastomer in a solvent from the group including benezene, methyl benezene and dimethyl benezene, dipping the heart pacemaker in the dispersed elastomer, evaporating the solvent from the elastomer and curing the elastomer coating in a humid environment.

3,971,389
PACEMAKER LOW CURRENT PULSE GENERATOR

Robert R. Brownlee, State College; Frank O. Tyers, Hershey, and Carl Volz, Sr., State College, all of Pa., assignors to Research Company, New York, N.Y.

Filed June 26, 1975, Ser. No. 590,409
Int. Cl.² A61N 1/36
U.S. Cl. 128—419 PG 8 Claims

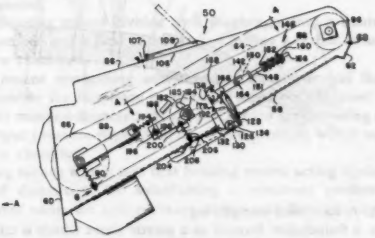


1. A pulse generating system for incorporation in a cardiac pacer or the like comprising:
a. a power cell having a first pole and a second pole with a difference of potential between them;
a first transistor;
a first resistor inserted between the collector of said first transistor and the second pole of said power cell;
a second transistor of a conductivity type opposite to that of said first transistor and having its emitter connected directly to said second pole;
a second resistor inserted between the base of said first transistor and the collector of said second transistor;
a third resistor inserted between the base of said second transistor and the emitter of said first transistor;
a first condenser inserted between the base of said second transistor and the collector of said first transistor;
a fourth resistor inserted between said first pole of said power cell and the emitter of said first transistor;
a second condenser having one side connected with said second pole and the opposite side directly connected to the junction between said fourth resistor and the emitter of said first transistor; and
means connected to the collector of said first transistor for conducting output pulses.

3,971,390
STONE TRAP FOR THRESHING AND SEPARATING MACHINE

James W. McDuffie; Claude K. Focht, both of New Holland, and Edward W. Rowland-Hill, Lancaster, all of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed June 3, 1974, Ser. No. 476,021
Int. Cl.² A01F 12/10
U.S. Cl. 130—27 JT 13 Claims



1. A threshing and separating machine comprising:
a. a frame adapted to travel across a field,
b. means mounted on the frame to thresh and separate grain from crop material,
c. means mounted on said frame for elevating crop material from the field to said threshing and separating means, the elevating means having a door pivotally mounted along the path of the crop material and adapted to move between a closed and an opened position,
d. means operably associated with said elevating means for controlling the movement of said door between its closed and opened positions, and
e. means operably associated with the controlling means and supported by said elevating means adjacent the path for exerting a force against solid objects in said path, said force affecting operation of said controlling means to open said door and eject solid objects under conditions where said objects travel along said path in the vicinity of said door.

3,971,391
PROCESS FOR IMPROVING THE QUALITY OF LIVING, HUMAN HAIR BY LANTHIONIZATION

Pierre Bore, Montfermeil; Jean-Claude Arnaud, and Grégoire Kalopissis, both of Paris, all of France, assignors to L'Oreal, Paris, France

Filed Mar. 8, 1974, Ser. No. 449,437
Claims priority, application Luxemburg, Mar. 8, 1973, 67178
Int. Cl.² A45D 7/06
U.S. Cl. 132—7 16 Claims

1. A process for improving and modifying the cosmetic properties of living human hair comprising thoroughly coating said hair, which is not subjected to any extension stress, with a composition consisting essentially of an aqueous medium of

an alkali or alkaline earth metal hydroxide present in an amount effective to impart to the composition a pH ranging from 12.5 to 13, and heating said hair at a temperature between 40 ±50 C, while maintaining said hair in the wet state, for a period of time effective to convert about 25 to 70 percent of the cystine in said hair to lanthionine.

3,971,392

HAIRPIECE, PARTICULARLY A TOUPET, AND PROCESS FOR MAKING SAME

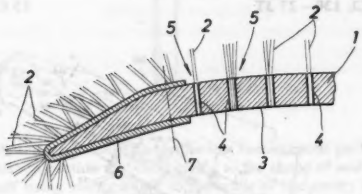
Kurt A. Brehmer, Bremen, Germany, assignor to Firma Carl Brehmer & Sohn, Bremen, Germany

Filed Apr. 12, 1974, Ser. No. 460,306

Claims priority, application Germany, Oct. 20, 1973, 2352818

Int. Cl.² A41G *3/00*

U.S. Cl. 132—53 **5 Claims**



1. A hairpiece comprising

a. a foundation formed as a plastic sheet which is curved to the shape of the head or a part thereof and having a plurality of holes therein perpendicular to the surface of said sheet and each of a diameter large enough to receive a plurality of hairs therein,

b. a plurality of hairs perpendicular to the surface of said sheet, the ends of which are inserted in said holes in said plastic sheet from one side thereof, and terminating flush at the other side thereof, there being at least one hair in each of said holes, and

c. a plug of adhesive in each such hole securing said hairs to said plastic sheet, each such plug terminating flush with the inner surface of said sheet.

3,971,393

APPARATUS FOR AUTOMATIC SUPPLEMENT OF CHANGE COINS IN A COIN OPERATED MACHINE

Kazuyuki Akai, Sakato, and Osamu Kobayashi, Saitama, both of Japan, assignors to Kabushiki Kaisha Nippon Koinko, Tokyo, Japan

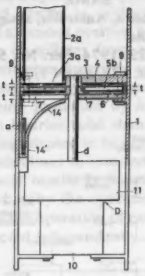
Filed Oct. 10, 1974, Ser. No. 513,946

Claims priority, application Japan, Oct. 12, 1973, 48-113850; Nov. 14, 1973, 48-130737; Apr. 23, 1974, 49-45100; Apr. 23, 1974, 49-45101; Apr. 23, 1974, 49-45102

Int. Cl.³ G07D *9/06*

U.S. Cl. 133—2 **10 Claims**

1. An apparatus for automatic supplement of change coins in a coin operated machine having a coin selection control device including a change coin cylinder and a switch means, said apparatus being detachably connected to said coin selection control device and comprising a change coin storing section including a change coin containing cylinder, discharging means operatively coupled with said coin storing section for discharging coins stored in the change coin storing section, guide means for receiving coins discharged from the discharging means and for guiding the coins to the change coin cylinder of the coin selection control device and means connected to said switch means so as to be operated thereby upon detection of a shortage of coins in the change coin cylinder by the



switch means, for operating the discharging means to supply change coins to said change coin cylinder.

3,971,394

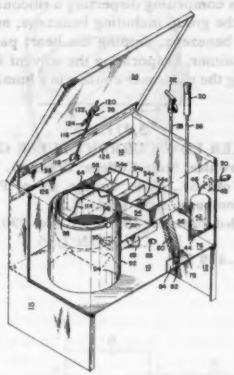
APPARATUS FOR CLEANING VEHICLE PARTS

Irving R. Osborne, 1602 Rockefeller, Everett, Wash. 98201

Filed Apr. 28, 1975, Ser. No. 572,156

Int. Cl.² B08B *3/02, 3/10*

U.S. Cl. 134—104 **4 Claims**



1. A washer for vehicle parts, comprising:

a tank containing a layer of water and a layer of lighter-than-water solvent;

a fluid pump having an inlet port positioned in said solvent layer for receiving solvent therefrom and an outlet port conveying solvent through a solvent supply conduit to a utilization point;

collection means beneath the utilization point for conveying solvent discharged from said solvent supply conduit after said solvent has washed the parts;

a plurality of inclined, sequentially arranged settling tanks receiving the solvent from said collection means;

a filter positioned adjacent the lower settling tank and receiving the solvent flowing therefrom, said filter tank containing a filter material, a discharge port beneath said filter material and a tube connected to said discharge port opening into said water layer; and

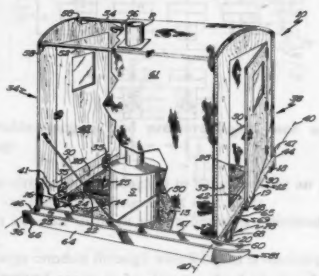
a filter barrier dividing said tank into two compartments, a first compartment receiving the contents of said filter tank and a second compartment communicating with said

fluid pump inlet port whereby recirculated solvent sequentially flows through said filter barrier, pump, collection means, settling tanks, filter tank and water layer.

3,971,395
COLLAPSIBLE SELF-STORING SHELTER

Vincent B. Lipinski, P.O. Box 41, Chaska, Minn. 55318

Filed Dec. 16, 1974, Ser. No. 533,319
Int. Cl.² E04B *1/347*; A45F *1/16*
U.S. Cl. 135—4 R 6 Claims

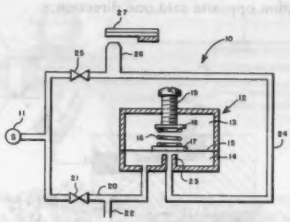


1. A collapsible, self-storing shelter comprising:
a rigid, substantially horizontal platform having a generally flat floor surface;
a rear wall having a base swingably mounted to said platform to swing about a first generally horizontal axis between an upright erected position and a lowered storage position overlying and confronting said floor surface, said first axis being parallel to and at a first distance above said floor surface;
a front wall spaced longitudinally along said platform from said rear wall and having a base swingably mounted to said platform to swing about a second generally horizontal axis between an upright erected position and a lowered storage position overlying and confronting said rear wall when said rear wall is in lowered position, said second axis being parallel to said first and at a second distance above said floor surface exceeding said first distance;
a plurality of cables extending between said platform and each of said front and rear walls, permitting said walls to be swung from lowered storage positions to erected positions and preventing further swinging of said walls beyond erected positions;
a plurality of longitudinal beams removably attached to each of said front and rear walls and extending therebetween, and preventing swinging of said front and rear walls toward one another when attached thereto, said beams cooperating with said cables to retain said walls in erected positions; and
a foldable, flexible, weather-resistant tarpaulin extending between and fixed to said front and rear walls and fixed to said platform, said tarpaulin being supported upon said plurality of beams to form an integral roof and side walls when said front and rear walls are in erected positions and foldably stored and confined between said front and rear walls when said front and rear walls are in lowered positions; and
one of said walls having a closable entryway therein to permit entry into the shelter.

3,971,396
PNEUMATIC RELAY

Louis J. Bentsen, Arlington Heights, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed July 16, 1975, Ser. No. 596,688
Int. Cl.² G05D *16/00*
U.S. Cl. 137—82 14 Claims



1. A pneumatic relay comprising:
terminal means adapted to be connected to a source of pressure;
first housing means divided by a diaphragm into a control chamber and a flow chamber and having a nozzle in said flow chamber;
first means connecting said terminal means to said flow chamber for supplying pressure to said flow chamber;
output means connected to said first means for providing an output pressure dependent upon said pressure within said flow chamber;
biasing means within said first housing means acting against said diaphragm for establishing a minimum predetermined value for said pressure within said flow chamber; and,
second means including condition responsive means connected to said nozzle, said condition responsive means applying a signal pressure to said flow chamber and having sufficient capacity to bleed off said pressure supplied by said first means above said predetermined value until said signal pressure achieves a value substantially equal to said predetermined value
whereby said output pressure will be substantially equal to said predetermined value until said signal pressure attains said value substantially equal to said predetermined value at which time said output pressure will follow said signal pressure.

3,971,397
PUMP UNLOADING VALVE DEVICE

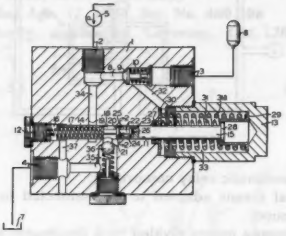
Diether Staisch, Walsrode, Germany, assignor to WABCO Westinghouse GmbH, Hannover, Germany

Filed June 5, 1975, Ser. No. 584,189
Int. Cl.² G05D *16/10*
U.S. Cl. 137—116 10 Claims

1. For interposition in a conduit connecting the discharge of a fluid pressure pump to a fluid pressure storage reservoir, an unloading valve device operative to control flow of fluid under pressure from the pump to either the reservoir or a return tank, said unloading valve device comprising:
a. a casing having formed therein a plurality of passageways and a bore extending through said casing and intersecting a first pair of said passageways, one of which is connected to the discharge of the pump and the other to the return tank,
b. a one-way flow valve providing for the flow of fluid under pressure from said one passageway to the storage reservoir and preventing reverse flow from said reservoir, wherein the improvement comprises:
c. a pair of cylindrical valve members of equal diameter slidably mounted in said bore and cooperating with said bore to form a chamber between their adjacent ends, the

other end of one of said cylindrical valve members being so subject to the pressure in the storage reservoir as to enable said pressure to shift said valve members in one direction in said bore until the adjacent end of the other valve member begins to open a communication between said one passageway of said pair of passageways and said chamber,

d. separate biasing means acting on each valve member in the direction opposite said one direction,



e. a lost-motion connection connecting said cylindrical valve members and disposed in said chamber therebetween, and

f. means restricting flow of fluid under pressure from said chamber to the return tank and thereby effective, upon said adjacent end of said other valve member beginning to open said communication, to cause the fluid under pressure admitted from the discharge of the pump to said chamber to establish a pressure therein to shift said other valve member, relative to said one valve member a distance corresponding to said lost-motion connection, to a fully open position.

3,971,398

APPARATUS FOR AUGMENTING VENOUS BLOOD FLOW

Duane F. Taylor, 680 Winter St., SE., Salem, Oreg. 97301; Richard C. Everett; Harry F. Everett, both of 6159 SW. Fernbrook Circle, Lake Oswego, Oreg. 97034, and Norman C. Williams, Rte. 1, Box 134, West Linn, Oreg. 97068

Division of Ser. No. 422,208, Dec. 6, 1973, Pat. No. 3,892,229. This application Nov. 25, 1974, Ser. No. 526,818

Int. Cl.[2] F16K *11/22*

U.S. Cl. 137—119 2 Claims

1. In a shuttle valve structure,

a valve body having a first pair of spaced diaphragm chambers and a supply passage extending therebetween with a supply port connected to the passage,

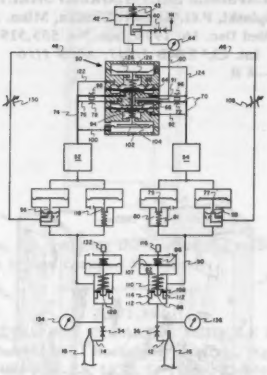
a pair of unstable diaphragms mounted in the diaphragm chambers,

means extending through the supply passage and connecting the diaphragms for movement together between first positions engaging one end of each of the chambers and second positions engaging the other end of each of the diaphragm chambers,

the inner ends of the chambers having central raised portions and depressed outer portions so that the diaphragms engage only the raised portions,

the body having a pair of actuating passages having chamber inlet ports opening into the depressed outer portions of the chambers and also having a pair of outlet passages leading from chamber outlet ports at the raised portions to the exterior of the valve body,

the outer ends of the chambers having raised portions spaced radially inwardly from the outer walls thereof and depressed outer portions so that the diaphragms engage only the last-mentioned raised portions,



the valve body having a pair of passages having chamber inlet ports at the last-mentioned depressed outer portions.

3,971,399

ARRANGEMENTS FOR PREVENTING OR MINIMIZING OVER-PRESSURES IN GAS PIPES

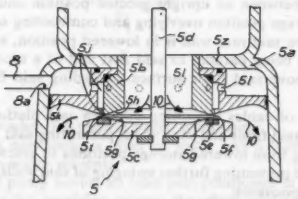
Jean-Philippe Cornil, Houilles, France, assignor to Gaz de France, France

Filed Oct. 10, 1974, Ser. No. 513,755

Claims priority, application France, Oct. 11, 1973, 73.36355

Int. Cl.[2] G05D *11/00*

U.S. Cl. 137—119 6 Claims

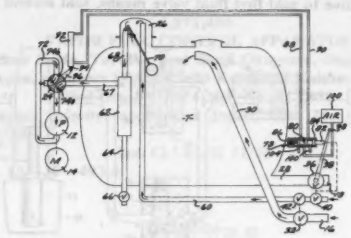


1. In an assembly for preventing or minimising over-pressures due to sudden interruptions in the flow of a compressible fluid caused by an obturator such as an electrical valve which is situated on a main gas pipe, said arrangement being of the type which comprises a pressure regulator and reducer, having a valve and a valve seating, said regulator and reducer being mounted on said main pipe upstream of said obturator and the response time of which is longer than that of said obturator, a venturi which communicates with that section of said main pipe which is situated between said obturator and said regulator and reducer, and a buffer reservoir which is in permanent communication with said section of said main pipe via said venturi, the invention which consists in that said regulator and reducer valve and valve seating also forms said venturi.

3,971,400
PORTABLE VACUUM AND PRESSURE LIQUID TANK APPARATUS

David L. Thompson, 7895 Berner St., Long Beach, Calif. 90808

Filed Jan. 24, 1975, Ser. No. 543,660
Int. Cl.[2] B67C 3/16
U.S. Cl. 137—205 10 Claims



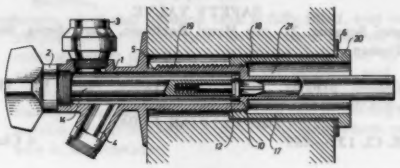
1. Portable vacuum and pressure liquid tank apparatus comprising:
a tank;
a power-driven pump adapted to supply either air pressure or a vacuum to the interior of said tank;
an inlet conduit through which liquid is admitted to said tank;
a discharge conduit through which liquid is discharged from said tank;
a bleeder line connecting the atmosphere with the upper interior of said tank;
an inlet valve in said inlet conduit having a valve element movable between an open and a closed position;
a drain valve in said discharge conduit having a valve element movable between an open and a closed position;
first and second bleed valves arranged in series in said bleeder line;
first and second levers that actuate said inlet and drain valves respectively;
first linkage means interconnecting said first lever and said first bleed valve so that movement of said inlet valve towards an open position will effect movement of said first bleed valve towards an open position;
second linkage means interconnecting said second lever and said second bleed valve so that movement of said drain valve towards an open position will effect movement of said second bleed valve towards a closed position; and
lost-motion connection means interposed in said first and second linkage means constructed and arranged so that said first and second bleed valves will not be moved towards an open position and closed position, respectively, until after said inlet and drain valves have been moved towards an open and a closed position, respectively, to thereby avoid damage to the valve elements of said inlet and discharge valves by foreign matter entrained in said liquid.

3,971,401
SILLCOCK

Bengt Arne Persson, Djursholm, Sweden, assignor to B A Installationsutveckling AB, Djursholm, Sweden

Filed Aug. 29, 1974, Ser. No. 501,823
Claims priority, application Sweden, Aug. 31, 1973, 7311923; Aug. 16, 1974, 7410483
Int. Cl.[2] F16K 51/00
U.S. Cl. 137—360 7 Claims

1. A water faucet for mounting in a wall between a warm space on one side of the wall and a cold space on the other side of the wall, comprising a pipe extending continuously through the wall and having a first axial end at the warm side of the wall and a second axial end at the cold side of the wall so as to provide a water flow passage through the wall, a shut-off valve for the water flow through said pipe, said shut-off valve including a stationary valve seat fixed within said pipe to the inside of the wall of the pipe at a point along the pipe substantially equally spaced from said first and second

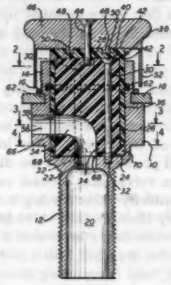


ends of the pipe and a movable valve body cooperating with said valve seat, a valve control member at said second end of said pipe, and a valve control rod extending axially within said pipe between said valve control member and said valve body and operatively connecting said valve control member to said valve body.

3,971,402
ROTARY VALVE ASSEMBLY

William C. Gallo, 4602-27th Ave. South, St. Petersburg, Fla. 33711

Filed Apr. 21, 1975, Ser. No. 570,197
Int. Cl.[2] F16K 5/04
U.S. Cl. 137—382 1 Claim



1. A valve comprising a housing formed with a cylindrical bore opening at one end of said housing and terminating at its other end within said housing; a cylindrical core fixed coaxially within said bore in sealed relation to the bore's said other end, said core being of lesser diameter than said bore to provide an intervening cylindrical area between the bore and the core; a one piece, inverted-cup-shaped valve element having a depending cylindrical wall extending with a close sliding fit within said intervening cylindrical area substantially throughout the axial dimensions of said core, and a radially extending top, integral with said depending cylindrical wall; a manually operable one piece inverted-cup-shaped knob having a radially extending portion intimately overlying said top of the valve element, said knob and the top of the valve element being provided with coacting recesses and dogs constraining the knob and the valve element to turn in unison; a generally ell shaped fluid passage in said core communicating between a central area at the bottom of the core and a side area at one side of the core, separate fluid passages in said housing connecting said central and side areas of the core with distal fluid supply and fluid discharge areas; said depending cylindrical wall of the valve element having an opening of limited size, alignable with a side end of said ell shaped passage by turning

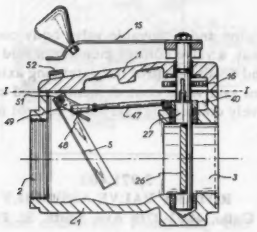
of said valve element to permit fluid flow from the latter passage to one of said separate fluid passages in the housing; and said fluid flow being discontinuable by turning of said valve element to bring said opening into non-alignment with said side end of the ell shaped passage.

3,971,403

SAFETY VALVE

André Sergent, 21, rue Henri Barbusse, Paris 5eme, Seine, France

Filed Nov. 13, 1974, Ser. No. 523,551
Claims priority, application France, Nov. 14, 1973, 73.40530
Int. Cl.² F16K 17/04
U.S. Cl. 137—459 4 Claims



1. In a safety valve-body for fluids, provided internally with an upstream seat and a downstream seat and comprising on the upstream side a first valve member openable to a degree dependent on the fluid flow rate, bearing internally upon said upstream seat and on the downstream side a second fully opening valve member including a shaft portion carrying thereon return means for sharply closing said second valve member, and mechanical linkage means coupling said second valve member to said first valve member, said first valve member being constituted by a swing-valve including means for urging it into closed position against the direction of the fluid flowing through the valve, said second valve member being constituted by a butterfly-valve having a shaft with one end projecting externally through said valve-body, said mechanical linkage means including a lever and a spring linking said lever to said first valve member, and a rod with a clevis fitted on one end thereof, said lever being in articulating relationship on said clevis, the second end of said rod comprising a ball engaged in a catch having an axle parallel to the shaft of said second valve member and provided with a matching portion in engagement with a cam fitted on said shaft, a latching means for opening of said second valve member comprising a lever fitted on the end of said shaft projecting externally, the free end of said lever being engageable in a latching notch on said body, whereby a predetermined position of said first valve member allows said mechanical linkage to cause disengagement of said catch from said cam and the sharp closure of aid second valve member.

3,971,404

HYDRAULIC RUNAWAY CONTROL VALVE

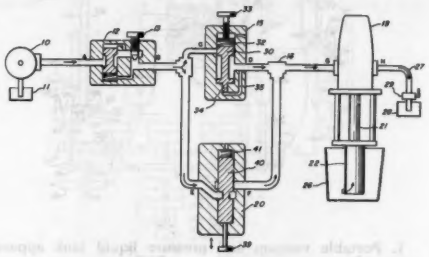
Vernon Kenneth Quarve, Minneapolis, Minn., assignor to Graco Inc., Minneapolis, Minn.

Filed June 17, 1974, Ser. No. 480,124
Int. Cl.² F16K 17/20
U.S. Cl. 137—462 1 Claim

1. Pressure sensing and responding apparatus for insertion in series relationship in a pressurized fluid line for stopping fluid flow on sensing a downstream pressure drop below a predetermined value, comprising:

a. a first fluid valve means for opening and closing said fluid line flow, said first fluid valve means having an adjustable spring-biased valving mechanism in a normally closed position and having an interior cylindrical chamber with end walls and with a slidable spool valving mechanism therein, one end of said spool valving mechanism having a compression spring biasing it away from an interior chamber end wall and the other end of said spool valving mechanism having a piston surface area;

b. a second fluid valve means for manually causing fluid flow in said fluid line, in parallel fluid flow connection relative to said first fluid valve means, said second fluid



valve means having an interior cylindrical chamber with end walls, and said chamber having a slidable spool valve mechanism with a compression spring between an end wall of said chamber and an end of said slidable spool, said spring urging said spool in valve-closing position, and further comprising means for manually moving said spool into valve-opening position;

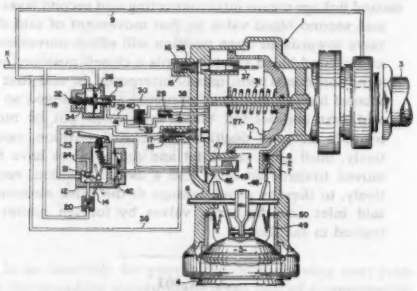
c. a pressure coupling passage having one opening in fluid contact with said first fluid valve means piston surface area, and a second opening in fluid contact with the downstream side of said first fluid valve means.

3,971,405

PRESSURE CONTROLLED HYDRANT VALVE COUPLER

James S. Millar, Fountain Valley, and Douglas R. Garrett, Los Angeles, both of Calif., assignors to Parker-Hannifin Corporation, Cleveland, Ohio

Filed July 15, 1974, Ser. No. 488,392
Int. Cl.² F16K 31/12, 11/10
U.S. Cl. 137—489 7 Claims



1. In a pressure controlled valve assembly of the type wherein a valve housing has therein a pilot operated main pressure control valve which defines a pressure seating chamber with said housing having restricted communication with fluid pressure upstream of a seat in a valve housing passage and wherein said main valve is moved toward and away from said seat to control flow of fluid through said passage responsive to actuation of a pilot valve to bleed said chamber to the downstream side of said seat by pressure differential of a reference fluid pressure source and fluid pressure downstream of said seat acting on said pilot valve, the improvement which

comprises a fast closing valve in said housing which is actuated by such reference fluid pressure independently of the magnitude of the downstream fluid pressure to close communication of said chamber with fluid pressure upstream of said seat and which, upon release of such reference fluid pressure acting thereon, opens communication of said chamber with fluid pressure upstream of said seat for rapid movement of said main pressure control valve toward said seat.

3,971,406

VAPOR FUEL CONTROL APPARATUS

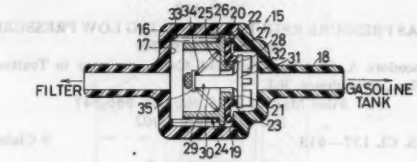
Mosami Inada, Toyoake, and Shuji Okumura, Obu, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Oct. 24, 1974, Ser. No. 517,611

Claims priority, application Japan, Oct. 24, 1973, 48-119759

Int. Cl.² F16K *17/26*

U.S. Cl. 137—493.4 **2 Claims**



1. A fuel vapor control apparatus for use in a fuel system between a gasoline tank and a filter-supporting canister for maintaining the gasoline tank side at a preselected pressure, comprising in combination:

a main body of plastic material having an opening therethrough;

first valve means movably disposed within said opening of said main body and including

a. a valve stem having a tubular portion, a radially inwardly extending end wall portion integrally formed at one end of said tubular portion, a radially outwardly extending end wall portion integrally formed on the periphery of said tubular portion at said one end thereof, and a valve member squeezing portion integrally formed on the inner end of said radially inwardly extending end wall portion defining a central aperture through said valve stem,

b. an annular elastic valve member having an inner end portion securely fitted to said end wall portion of said valve stem around said central aperture thereof through said valve member squeezing portion with one end face of said annular valve member being disposed against the outside surface of said end wall portion of said valve stem, an outer tongue portion formed on the peripheral surface of the end wall of said annular valve member facing away from the end wall of said valve stem, and a projecting foot portion also formed on said surface of said annular valve member adjacent to said inner end portion thereof and facing away from the end wall of said valve stem;

c. a first spring interposed between said main body and said valve stem for urging said annular elastic valve member carried by said valve stem to move in one direction wherein said outer valve tongue is caused to seat on an inner wall of said main body; and

second valve means movably disposed within said first valve means and including

d. a plunger extending through said central aperture of said first valve means,

e. a circular disc integrally formed on one end of said plunger, having a projecting portion on the face thereof remote from said plunger for maintaining suitable air flow thereby, and

f. a second spring interposed between the other end of said plunger and said valve stem of said first valve means for urging said circular disc to move in a direction opposite to said one direction of movement of said annular elastic valve member of said first valve means, wherein said circular disc is maintained seated against said projecting foot portion of said annular elastic valve member;

whereby when said gasoline tank is fully filled, said outer tongue portion of said first valve means is released from seating against said inner wall of said main body by the vapor of gasoline, and when said gasoline tank approaches vacuum, said circular disc of said second valve means is released from seating against said projecting foot portion of said first valve means by the atmospheric pressure in said canister.

3,971,407

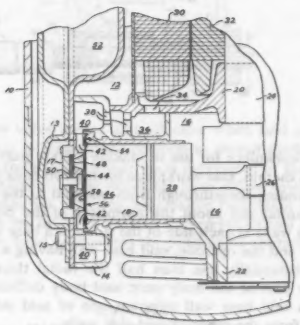
MEANS FOR LOCATING SUCTION VALVE

Eugene Hudson, and Henry R. Geary, both of Tyler, Tex., assignors to General Electric Company, Louisville, Ky.

Filed Aug. 22, 1975, Ser. No. 606,864

Int. Cl.² F16K *15/08*

U.S. Cl. 137—516.15 **2 Claims**



1. In a reciprocating compressor having a cylinder block assembly including seat means and head assembly,

a. a valve member between said seat means and said head assembly having a flat face and including intake means providing an annular intake zone in said flat face for passage of gas through said valve member;

b. a valve movable between an open and closed position for controlling the passage of gas through said intake means including a thin flat ring of flexible metal having a continuous portion near its inner periphery mounted concentrically with said intake zone covering said intake zone in its closed position and support portions projecting from its outer periphery supporting said valve on said seat means adjacent said flat face of said member;

c. guide means including a flat ring circumscribing said valve having a thickness greater than said valve and a continuous portion near its outer periphery arranged between said flat face and said seat means for allowing movement of said valve, and recess portions extending inwardly from its inner periphery for receiving said support portions of said valve;

d. said seat means providing a backing surface for limiting the movement of said valve in said open position;

wherein the improvement comprises:

retaining means on the inner periphery of said guide means being formed adjacent the open end of said recess portions projecting axially toward said backing surface for preventing movement of said valve relative to said guide means and from moving between said guide means and said backing surface.

3,971,408

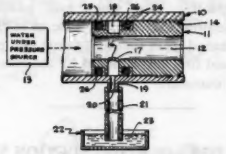
SPRAYER NOZZLE CONSTRUCTION

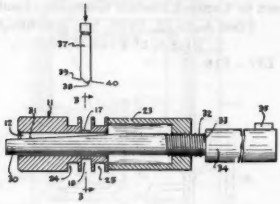
Frank A. Simmons, Grayslake, Ill., assignor to Burgess Vibrocrafters, Inc., Grayslake, Ill.

Division of Ser. No. 348,034, April 5, 1973, Pat. No. 3,861,194, which is a division of Ser. No. 125,129, March 17, 1971, Pat. No. 3,760,479. This application Sept. 16, 1974, Ser. No. 506,248

Int. Cl.[2] B23P 17/00; B23Q 7/00

U.S. Cl. 137—604 2 Claims





1. A workpiece for use in making a body part which has a Venturi therein, said workpiece having two ends and an opening extending therethrough from one end to the other, a circumferential slot about the periphery of the body part and defining walls at each side of the slot and a base wall between the slot and the opening, said base wall having a radial thickness substantially less than half the radial thickness of the thickest part of the body part, said body defining an orifice through said base wall adjacent one of said side walls and spaced from the other of said side walls.

3,971,409

PRESSURE REGULATOR FOR PNEUMATIC SYSTEMS

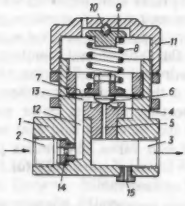
Friedrich Bauer, Vienna, Austria, assignor to Hoerbiger Ventilwerke Aktiengesellschaft, Vienna, Austria

Filed Oct. 24, 1974, Ser. No. 517,831

Claims priority, application Austria, Oct. 25, 1973, 9073/73

Int. Cl.[2] F16K 21/00

U.S. Cl. 137—613 2 Claims



1. A pneumatic pressure amplifier for proportionally converting variations in an input pressure into amplified variations of an output pressure, comprising:

a housing including an inlet connected to receive a variable input pressure and an outlet having a fixed opening;

a regulator valve mounted within said housing between said inlet and said outlet and including a valve seat with a passage and a closure element for controlling fluid flow through said passage;

a diaphragm mounted within said housing for supporting said closure element and biased against said valve seat to subdivide said housing;

means for adjustably biasing said diaphragm in a direction opposite to the pressure from said inlet for controlling the operation of said valve;

a flow restrictor for reducing the pressure from said inlet and mounted upstream of said diaphragm in a feed passage from said inlet and having a cross-sectional area smaller than the cross-sectional area of the regulator valve when fully open; and

a pressure chamber interconnecting said restrictor with said closure element;

a restrictive discharge orifice having a fixed opening less than the opening of said outlet mounted downstream of said regulator valve leading to said outlet for restricting the rise of pressure within said outlet.

3,971,410

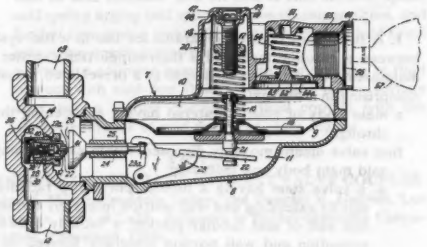
GAS PRESSURE REGULATOR HAVING LOW PRESSURE SHUT-OFF MEANS

Theodore A. St. Clair, Fairfield, Conn., assignor to Textron, Inc., Providence, R.I.

Filed Mar. 5, 1975, Ser. No. 555,547

Int. Cl.[2] F16K 15/02

U.S. Cl. 137—613 9 Claims



1. A gas pressure regulator comprising a housing having an inlet means, outlet means and a wall separating said inlet means and said outlet means; a diaphragm in the housing forming a gas chamber communicating with said outlet means and a chamber open to the atmosphere; an orifice sleeve extending between and communicating with said inlet means and said outlet means; means for mounting said orifice sleeve in said wall for axial sliding movement relative to said wall, said orifice sleeve having an orifice, an upstream valve seat and a downstream valve seat; a main valve; means operated by said diaphragm for moving said main valve toward and from said downstream valve seat of the orifice sleeve to regulate the flow of gas to said gas chamber and outlet means; and means including a safety valve slidably mounted in said orifice sleeve to engage said upstream valve seat to shut off the flow of gas through said orifice sleeve to said gas chamber and outlet means when the pressure of the gas in said gas chamber falls below a predetermined acceptable pressure.

3,971,411

VARIABLE RESISTANCE TYPE THROTTLING TRIM

Hans D. Baumann, Manville, R.I., assignor to Masonellan International, Inc., Norwood, Mass.

Division of Ser. No. 444,020, March 7, 1974. This application Apr. 4, 1975, Ser. No. 565,158

Int. Cl.[2] F16K 47/04

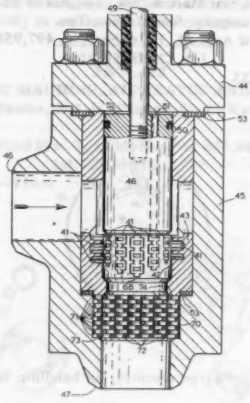
U.S. Cl. 137—625.3 3 Claims

1. Variable resistance type valve throttling element comprising:

a. a seatring having therewithin a continuous cylindrical bore, said seatring further having annular, non-cylindrical, inner wall surfaces at the opposite ends; of and terminating said continuous cylindrical bore;

b. a cylindrical valve plug reciprocatingly and slidingly engaged within said cylindrical bore of the seatring, and having an outer cylindrical wall surface;

c. a number of throttling flow channels penetrating radially outward from said continuous cylindrical bore of the seatring, at least one said penetrating channel commencing near one said continuous bore terminating surface of said seatring, and all said channels terminating within said other continuous bore terminating surface of said seatring, the non-cylindrical extent of said other continuous bore terminating surface being radially outward from said continuous cylindrical seatring bore whereby said other



terminating surface is not covered by the engaging of said cylindrical valve plug within said cylindrical seatring bore, said channels-terminating thereby establishing a number of openings within said other continuous bore terminating surface of said seatring to provide access for fluid in direction of the longitudinal plug axis, said channels adapted to be covered along their longitudinal axis by the outer cylindrical wall surface of the reciprocating plug, while said plug is slidingly engaged within the seatring bore, and said channels comprising one or more penetrating grooves extending circularly at least part way around the interface between the reciprocating plug and said seatring bore; each groove provided with one or more communicating vertical passageways to the next groove, and said vertical passageways alternatively off-set to each other in the direction along the circumference of the seatring bore.

3,971,412

QUICK ACTING VALVES

Alexander Wierzbicki, Southport, England, assignor to Dewrance & Company, Limited, Skelmersdale, England

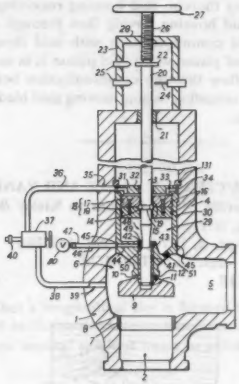
Filed Mar. 18, 1974, Ser. No. 451,902

Claims priority, application United Kingdom, Mar. 19, 1973, 13156/73

Int. Cl.² F16K *31/38, 11/04*

U.S. Cl. 137—625.5 **14 Claims**

1. A quick acting isolating valve comprising in combination a valve body having a fixed seat defining an opening through which connected system fluid may flow in a path between an inlet and an outlet, a moveable head adapted to cooperate with said seat to open and close said opening to fluid flow, said head being carried on a stem which is provided with a piston reciprocable in a piston chamber formed in the valve body substantially isolated from the fluid flow path, means operatively effective for applying system pressure to both sides of said piston, auxiliary valve means selectively operable between a first position for retaining system fluid pressure at the underside of said piston and a second position relieving system fluid pressure from the underside of said piston to enable movement of said head toward said seat, a fluid outlet from the chamber communicating the underside of said piston with



said auxiliary valve means and effective when said auxiliary valve means is in said second position to permit discharge of system fluid from the chamber upon movement of the piston within the chamber as the moveable head moves toward said seat and means for effecting progressive restriction of fluid flow through the outlet to cushion movement of said head as the moveable head approaches the position of abutment with said seat.

3,971,413

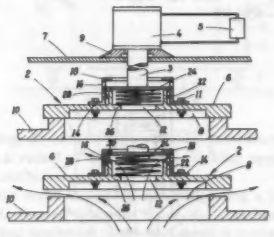
DAMPER ARRANGEMENT

Albert H. Berst, Louisville, Ky.; Robert Wright, Houston, Tex., and Wilson E. Kelley, Jr., Pleasure Ridge Park, Ky., assignors to American Air Filter Company, Inc., Louisville, Ky.

Filed Mar. 4, 1975, Ser. No. 555,153

Int. Cl.² F16K *1/54*

U.S. Cl. 137—630.14 **6 Claims**



1. A damper arrangement comprising:

a. a plate having an orifice located therein;

b. an orifice closing blade movably positioned between an open position and a closed position in relation to said orifice, said blade having an opening therein of relatively small diameter in relation to said plate orifice, said opening being in flowthrough communication with said plate orifice; and,

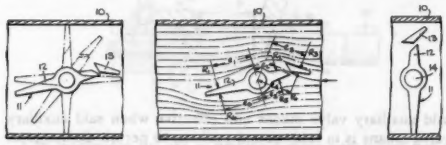
c. actuating means for moving said blade relative to said plate, said actuating means being in cooperation with a vent means, said vent means being in flow through communication with said opening upon actuation of said actuating means, said actuating means including a movably mounted piston with flow through apertures therein, said piston covering said opening in a fluid tight communication in one position and in fluid communication with said vent means in a second position, said vent means including a housing attached to said blade and surrounding said opening therein, said housing receiving said piston therein, said housing having flow through apertures therein in fluid communication with said flow through apertures in said piston when said piston is in said second position, said flow through communication being established prior to actuating means moving said blade from its closed position.

3,971,414

SERVO BUTTERFLY VALVE AND VANE

Henry Illing, Parksville, N.Y., assignor to Kieley & Mueller, Inc., Middletown, N.Y.

Filed Apr. 2, 1974, Ser. No. 457,266
Int. Cl.² F16K 1/22
U.S. Cl. 137—630.15 16 Claims



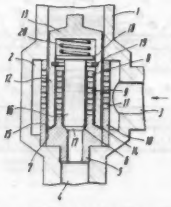
6. In a butterfly vane including a main vane portion for pivoting about a longitudinal axis and a servo tab movably mounted on said main vane portion in one quadrant of said vane to define a single auxiliary flow path passing through said vane between said main vane portion and said servo tab, said servo tab extending to a peripheral edge of said vane.

3,971,415

THROTTLE VALVE

Werner Föller, Heiligenrode, Germany, assignor to Gestra-KSB Vertriebsgesellschaft mbH & Co. Kommanditgesellschaft Bremen, Bremen, Germany

Filed July 14, 1975, Ser. No. 595,825
Claims priority, application Germany, Sept. 18, 1974, 2444607
Int. Cl.² F16K 1/44
U.S. Cl. 137—630.19 8 Claims



1. A throttle valve having a valve housing with inlet and outlet openings, and responsive to an actuating member comprising:

a valve seat element having a first valve seat for closing the outlet opening, and a second valve seat communicative to the inlet opening, said valve seat element having a coaxially extending jacket formed with a plurality of flow-through channels positioned at different planes;

a first piston-type locking member displaceably and adjustably disposed within said jacket and having a first sealing surface which cooperates with said first valve seat;

a second locking member displaceably disposed and surrounding said jacket, and having a second sealing surface opposite to said valve seat element which cooperates with said second valve seat on said valve seat element, said first and second locking members being displaceably connected with each other; and

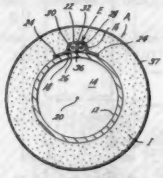
means for biasing said first locking member with respect to said second locking member.

3,971,416

PREINSULATED PIPE ASSEMBLY AND PIPELINE

Ben C. Johnson, San Marcos, Tex., assignor to Thermon Manufacturing Company, San Marcos, Tex.

Filed Aug. 16, 1974, Ser. No. 497,958
Int. Cl.² H05B 3/58
U.S. Cl. 138—33 12 Claims



1. A preinsulated pipe assembly for handling fluid, comprising:

a pipe having a fluid flow passage therethrough;

a heater housing mounted with said pipe and forming a cavity along the exterior of said pipe;

said heater housing including a channel member mounted on the exterior of said pipe such that said channel member and the exterior of said pipe form said heater housing cavity;

heating means disposable in said heater housing cavity for heating fluid in said flow passage of said pipe; and

pulling means mountable with said heating means for controllably pulling said heating means from said heater housing cavity without removal of said heater housing from said pipe.

3,971,417

HAND LOOM

Henri Gentil, 5, avenue Pierre Semard, Bourg, Ain, France

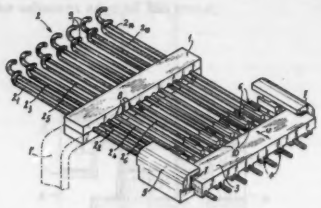
Filed Apr. 11, 1975, Ser. No. 567,100
Claims priority, application France, Apr. 12, 1974, 74.13621
Int. Cl.² D03D 29/00
U.S. Cl. 139—34 6 Claims

4. In a hand-weaving loom of the type wherein a multiplicity of needles are disposed in a parallel array in two groups, the needles of the groups interdigitating with one another, whereby in a first phase a weft web is formed from a yarn and in a second phase the same needles are drawn through the web to insert a warp therein, the needles having a weft-forming hook end and a warp-drawing eye end, the improvement which comprises:

a common fixed support for all of said needles, said needles each being rectilinearly, longitudinally displaceable relative to said support and slidable therein; and

a respective movable bar rigid with the needles of each of

said group and displaceable relative to said support in the direction of movement of said needles; and wherein



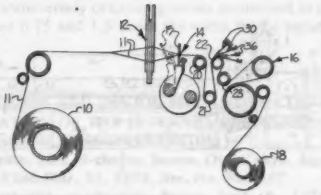
the groups of needles are shiftable alternately rectilinearly substantially in a common horizontal plane.

3,971,418

WEAVING MACHINE, APPARATUS AND METHOD

Stephen G. Fowler, 301 N. Cannon Blvd., Kannapolis, N.C. 28081

Filed Feb. 9, 1976, Ser. No. 656,649
Int. Cl.² D03D *39/24*
U.S. Cl. 139—116.6 **22 Claims**



1. A corduroy producing weaving machine comprising weaving instrumentalities for forming at a fell fabric having warpwise races of weftwise floats, take-off means for moving fabric along a predetermined path of travel from the fell, roll means mounted adjacent the predetermined path of fabric travel for guiding the fabric through a predetermined arc of travel, and severing means mounted adjacent said roll means and extending warpwise of the fabric along at least a portion of the predetermined arc of travel for entering into the races of weftwise floats and for severing the floats to form wales as the fabric is moved from the fell.

3,971,419

DRESSING FINGER FOR AUTOMATIC WIRING MACHINES

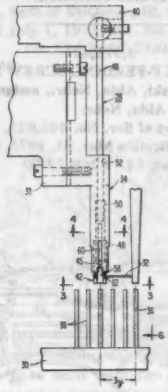
George J. Sprenkle, Phoenixville, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed July 31, 1975, Ser. No. 600,586
Int. Cl.² B21F *3/04*, *15/04*, *45/00*
U.S. Cl. 140—93 R **10 Claims**

1. A dressing finger assembly for use on automatic wiring machines to provide a predetermined pattern in a wire being connected to a terminal by an associated wrap tool, comprising:

a dressing finger having a plurality of contiguous, coaxial, cylindrical sections arranged in order of decreasing outside diameters,

a first and a second of said sections having respectively the largest and next largest diameters of said plurality of sections and being tubular, said first and second sections having coaxial apertures which are elongated in cross section and have their center lines displaced from the central longitudinal axis of said sections, the aperture in at least a first part of said first section having larger dimensions than the aperture in said second section, the size and displacement of each of said apertures being



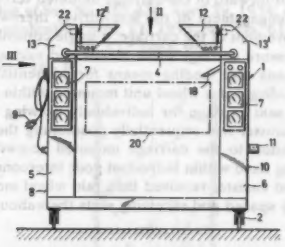
such that a longitudinal slot is formed in the wall of each of said sections, the axial center lines of the slots in said first and second sections being in substantial alignment.

3,971,420

DOSING DEVICE FOR INDUSTRIAL COOKING APPARATUS

Alfred Löhr, Bochum; Wolfgang Schwan; Wolfgang Tschek, both of Gelsenkirchen, and Günter Schreiber, Lunen, all of Germany, assignors to F. Kuppersbusch & Söhne Aktiengesellschaft, Gelsenkirchen, Germany

Filed Dec. 10, 1974, Ser. No. 531,373
Claims priority, application Germany, Dec. 11, 1973, 2361520
Int. Cl.² B65B *1/04*
U.S. Cl. 141—231 **10 Claims**



1. A dosing device for the automatic introduction of ingredients into a vessel of an industrial cooking apparatus, comprising in combination:

a. a mobile stand including means defining a bay-like, generally U-shaped space for receiving a stationary vessel of a cooking apparatus when said stand is moved next to the vessel into an operative position;

b. at least one cantilever member secured to said stand above said space;

c. a plurality of ingredient containers;

d. means pivotally attaching said containers to said cantilever member for providing for each container a first position in which the contents of the container are maintained therein and a second, or inwardly tilted, position in which the contents are discharged from the container by gravity directly into the vessel;

e. a spray tube mounted on at least one of said containers; and

f. means for supplying said spray tube with water for rinsing said at least one of said containers.

3,971,421

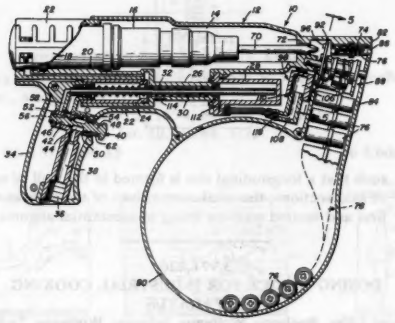
AIR-POWERED, SELF-FEEDING SCREW DRIVING TOOL

Harold E. Damratowski, Alda, Nebr., assignor to Triad Fastener Corporation, Alda, Nebr.

Continuation-in-part of Ser. No. 446,023, Feb. 26, 1974, abandoned. This application Mar. 31, 1975, Ser. No. 563,819

Int. Cl.² B26B *23/00*

U.S. Cl. 144—32 18 Claims



1. An automatic screwdriving tool comprising a casing, an air-powered screwdriver, a carriage mounting said screwdriver in said casing, air pressure drive means for reciprocating said carriage between a forward screw engaging and driving position and a rear retracted position, said casing including a canister for retaining a supply of screws, air pressure control feeding means for sequentially feeding screws from said canister to a point forward of the carriage mounted screwdriver for a selective engagement of the screwdriver therewith upon a forward movement of the carriage, a single control means for said air pressure carriage drive means and said air pressure feeding means said feeding means for sequentially feeding screws including a star wheel unit mounted within said casing forward of said carriage for individually drawing the screws from the canister and sequentially positioning the screws in driving relation to the carriage mounted screwdriver, said screws being fixed within individual pods interconnected into an elongated canister received belt, said wheel incorporating peripherally spaced pod receiving seats thereabout.

3,971,422

METHOD OF TREE FELLING

George E. Silvey, 2252 N. 5th St., Springfield, Oreg. 97477

Filed Oct. 2, 1975, Ser. No. 618,825

Int. Cl.² A01G *23/08*

U.S. Cl. 144—34 B 4 Claims

1. The method of felling a tree including the steps of,

cutting an undercut in the tree trunk, said undercut defined by planar sawn surfaces,

cutting a back cut terminating in an offset manner from the inner extremity of said undercut,

cutting multiple kerfs extending inwardly from said undercut into the tree holding wood located intermediate the inner extremities of the undercut and back cut so as to cause separation of the tree and stump to occur within the holding wood during felling of the tree and thereby avoid extraction of wood splinters from the butt of the tree being felled with a consequent loss of board feet of lumber, and

advancing the back cut into the holding wood until the tree commences falling.

3,971,423

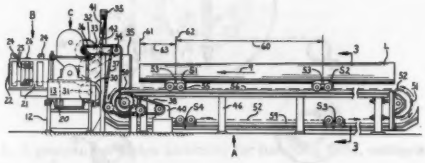
LOG FEEDER FOR CANTING MACHINE

Frederick L. B. Miller, Lake Oswego, Oreg., assignor to Mainland Industries, Inc., Lake Oswego, Oreg.

Filed Feb. 18, 1975, Ser. No. 550,468

Int. Cl.² B27C *1/12*; B27B *31/02*; B65G *15/42*

U.S. Cl. 144—176 10 Claims



1. In a canting machine having an infeed section arranged to feed a log lengthwise past at least one chipper head to slab a flat side on a lateral side of the log and an outfeed section for feeding the slabbed log away from said chipper head; means to provide two points of support spaced different distances apart in said infeed section for logs of different lengths, said means comprising a saddle carriage to support the leading end of the log and a saddle carriage to support the trailing end of the log with the log unsupported between said two carriages, said carriages allowing the log to rotate to stable position; a track for said carriages; endless chain means for moving said carriages toward said chipper head without rotational restraint on the log; and means adjacent the infeed side of said chipper head to restrain rotation of the log, said restraining means comprising a vertical knife edge guide wheel arranged to engage the underside of the log and lift the log off an approaching carriage, and a knife edge press wheel arranged to engage the upper side of the log above said guide wheel.

3,971,424

TIRE TREAD

Jacques Bolleau, Clermont Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Filed July 11, 1975, Ser. No. 594,970

Claims priority, application France, July 25, 1974, 74.25987

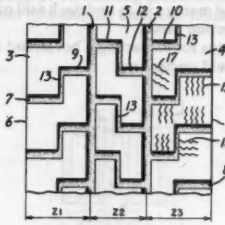
Int. Cl.² B60C *11/06*

U.S. Cl. 152—209 R 9 Claims

1. A pneumatic tire having a tread comprising two wide grooves of circumferential orientation and rows of wide grooves of transverse orientation defining circumferential rows of elements in relief, characterized in that:

a. a middle row and two side rows of elements in relief are formed, separated in each row by grooves of transverse

orientation discharging alternately, in the case of the middle row, into the wide grooves of circumferential orientation and, in the case of the side rows, into the adjacent wide groove of circumferential orientation and into the adjacent edge of the tread;



b. the grooves of transverse orientation of each row of elements in relief are connected in pairs by grooves of reduced width and at most the same depth as the depth of said longitudinal and transverse grooves; and

c. the sum of the lengths, projected on a meridian section, of the transversely oriented grooves connected in pairs is between 0.75 and 1.5 times the width of the tread.

3,971,425

PROCESS AND DEVICE FOR AUTOMATIC REGULATION OF THE INTERNAL PRESSURE IN A PNEUMATIC TIRE

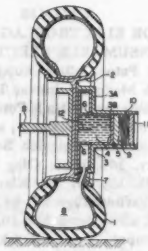
Yasuo Tsuruta, 22-2, 4-chome, Sanno, Ota, Tokyo, Japan

Filed Mar. 31, 1975, Ser. No. 563,657

Claims priority, application Japan, Sept. 6, 1974, 49-101974; Feb. 12, 1975, 50-16937; Feb. 26, 1975, 50-22748

Int. Cl.² B60C *23/12*

U.S. Cl. 152—418 **13 Claims**



1. Method of automatically regulating the pressure within a pneumatic tire which comprises the steps of

providing centrifugal means positioned radially inward of said tire which is mounted to rotate when said tire is rotated, and to exert a radially outward pressure during such rotation, and

placing said centrifugal means in pressure-exchange relationship with the interior of said tire, whereby rotation of said tire and centrifugal means results in adding the radially outward pressure exerted by said centrifugal means to the original pressure with said tire when, but only when, said tire and centrifugal means are rotating.

3,971,426

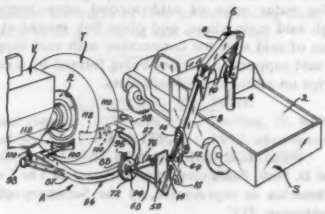
APPARATUS FOR CHANGING GIANT TIRES IN THE FIELD

Vallie D. West, 724 N. Washington St., and Jesse Kennedy, 201 S. Illinois Ave., both of DuQuoin, Ill. 62832

Filed July 1, 1975, Ser. No. 592,105

Int. Cl.² B60C *25/06*

U.S. Cl. 157—1.28 **17 Claims**



1. An apparatus for breaking the beads on the sidewalls of a tire away from bead seats on a rim on which the tire is mounted, said apparatus comprising: a rigid frame having spaced apart legs, the spacing between which is greater than the distance between the sidewalls on the tire; a tube on the end of each leg; a pressing shoe carried by each leg with the shoes of the two legs being located directly opposite each other, the shoes being configured and positioned to bear facewise against the sidewalls of the tires; and force exerting means for reducing the spacing between the shoes so as to force the sidewalls of the tire together and thereby break the beads away from the bead seats, said force exerting means including a fluid operated cylinder housed in the tube on each leg, the cylinders being axially aligned, and means for altering the axial positions of the cylinders in the tubes.

3,971,427

VENETIAN BLIND PROFILED SLATS

Heiko Coldewey, Jeddeloh; Mario Ammazzalorso, and Karl-Heinz Kaps, both of Oldenburg, all of Germany, assignors to Firma Justin Huppe, Oldenburg, Germany

Continuation of Ser. No. 465,430, April 29, 1974, abandoned. This application Sept. 11, 1975, Ser. No. 612,552

Int. Cl.² E06B *9/26*

U.S. Cl. 160—166 R **6 Claims**

1. A venetian blind having a plurality of slats carried by supporting devices each of which is profiled transversely to its length, each slat having a substantially planar central section and first and second edge sections respectively connected to

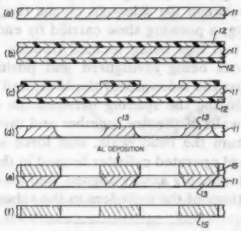
and integral with opposite sides of said central section and respectively having free outer edges, the main plane of the central section being inclined at an acute angle with the connecting plane which passes through the outer edges of the edge sections, said central section having openings therein, raising devices extending through said openings, each slat having an asymmetrical cross-sectional profile such that said first edge section adjacent the central section includes a protuberance, a straight line between the top of said protuberance and the outer edge of said second edge section passing through said main plane, and pivot link means at said outer margins of said slats for connection with said supporting devices, said supporting devices being formed by a pair of vertical strips on either side of said slats.

3,971,428

METHOD FOR MAKING BEAM LEADS

Ronald D. Hall, Baltimore, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 17, 1975, Ser. No. 623,526
Int. Cl.² B22D *23/00*; H05K *3/14*
U.S. Cl. 164—46 4 Claims



1. A process for making beam leads for use in the interconnecting of electronic packages to substrates comprising the steps of,

coating metallic foil with a resist pattern,

then etching said metallic foil with said resist pattern thereon to form a metallic foil pattern having a plurality of beam leads,

then depositing a second metal different than said metal of said metallic foil which said second metal has poor adhesion with said metallic foil, and

then separating said deposited second metal from said metallic foil to provide a plurality of second metal beam leads and whereby said metallic foil pattern is reuseable as a depository for another deposition of said second metal.

3,971,429

PROCESS OF EXTRACTING A HOT SLAB FROM A CONTINUOUS CASTING MOULD AND AN APPARATUS THEREFOR

Mathias Horeth, Linz, Austria, assignor to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Linz, Austria

Filed July 31, 1975, Ser. No. 600,812
Claims priority, application Austria, Aug. 27, 1974, 6913/74
Int. Cl.² B22D *11/08*
U.S. Cl. 164—82 6 Claims

1. A process of extracting a hot slab from a continuous casting mould with a lower opening by means of a tong-shaped starter bar head connected to a starter bar, comprising the steps of:

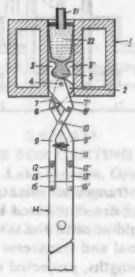
inserting the tong-shaped starter bar head having nippers forming a bit into the lower opening of said mould and thereby closing it,

filling the bit formed between said nippers in closed position with molten metal and allowing the molten metal to solidify, thus forming a cast connection piece,

subsequently extracting said starter bar head, and

opening the nippers of the tong-shaped starter bar head in a controlled manner so as to detach said nippers from said cast connection piece.

4. An apparatus for extracting a hot strand from a continuous casting mould comprising:



a starter bar,

a tong-shaped starter bar head dimensioned to fill the mould cross-section when inserted therein, said tong-shaped starter bar head being composed of tong-nippers defining an upwardly open cavity in their closed position and of tong-legs,

a shear-like linkage connected to the tong-legs,

two connecting brackets pivotable to and from the axis of the strand and connecting the shear-like linkage with the starter bar, and

arcuately extending rails forming forced guide means connected with the connecting brackets for producing straddling and closing movements of the connecting brackets and for an analogous movement of the tong-nippers.

3,971,430

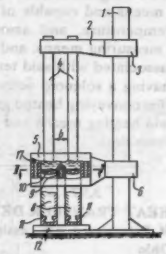
FURNACE FOR ELECTROSLAG REMELTING OF CONSUMABLE ELECTRODES

Boris Evgenievich Paton, ulitsa Kotsjubinskoga, 9, kv. 21; Boris Izrailevich Medovar, bulvar Lesi Ukrainki 2, kv. 8; Jury Pavlovich Shtanko, ulitsa E.Potie, 9, kv. 92, all of Kiev; Georgy Emmanuilovich Tsukanov, ulitsa Ryleeve 24/7, kv. 26, Moscow; Alexei Georgievich Bogachenko, ulitsa Muljutenko 15/2, kv. 141, Kiev; Oleg Petrovich Bondarenko, ulitsa Kreschatik 15, kv. 34, Kiev; Viktor Mikhailovich Martyn, ulitsa Vernadskogo 67, kv. 81, Kiev; Vitaly Mikhailovich Baglai, ulitsa Semashko 10, kv. 54/3, Kiev; Leonid Mikhailovich Stupak, Brest-Litovsky prospekt, 39, kv. 9, Kiev; Viktor Leonidovich Artamonov, ulitsa Sovskaya 9, kv. 4, Kiev, and Georgy Anatolievich Pavlichuk, ulitsa Erevanskaya 8, kv. 8, Kiev, all of U.S.S.R.

Continuation of Ser. No. 233,627, March 10, 1972, abandoned. This application Apr. 8, 1975, Ser. No. 551,682
Int. Cl.² B22D *27/02*
U.S. Cl. 164—252 2 Claims

1. A furnace for the electroslag remelting of consumable electrodes for simultaneously forming at least two ingots, comprising: electrode supporting means including an electrode holder secured thereon and carrying at least two consumable electrodes connected to a power supply source; a mould having a common internal spatial cavity adapted to contain slag and having at least two separate ingot-shaping zones divided by at least one cooled vertical dividing wall; the dividing wall adapted to separate the molten metal in each

ingot-shaping zone into separate pools and permit a common slag bath for the zones; the dividing wall is of a split construction made up of dismountable elements at least one of which is provided with a connecting piece for individual connection to a coolant source for cooling the dividing wall; each electrode being positioned over each ingot-shaping zone; a baseplate adapted to close the ingot-shaping zones from below during a first stage of the melting process; means for creating a relative motion between the electrode holder and the mould



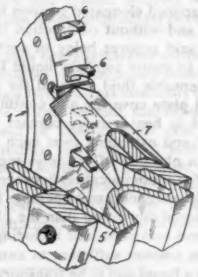
and the baseplate in a vertical direction; the height of the dividing wall is from 0.5–2.5 times the dimension of a minimum cross-sectional side of the part of the ingot-shaping zone; the width of the dividing wall does not exceed the spacing between the internal surfaces of the two adjacent consumable electrodes; the number of consumable electrodes equals the number of ingot-shaping zones; and the upper edge of the dividing wall is chamfered, forming angles of about 15°–85° to the horizon.

3,971,431

COOLING DEVICE FOR THE WHEEL OF A CONTINUOUS CASTING MACHINE

Giulio Properzi, Via Pietro Cossa, 1, Milan, Italy (20122)

Filed Nov. 4, 1974, Ser. No. 520,700
Claims priority, application Italy, Nov. 12, 1973, 31214/73
Int. Cl.² B22D *11/06*
U.S. Cl. 164—278 **4 Claims**



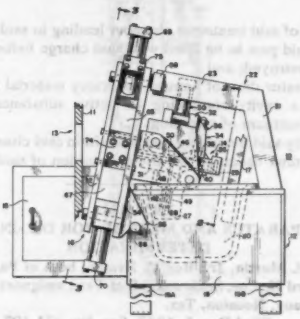
1. A cooling device for a continuous casting machine of the wheel and belt type having a casting wheel comprising a casting ring thereon defining with said belt a mold for the metal to be cast, the device comprising an annular header arranged internally to said casting ring, a plurality of spray nozzles arranged on said header for spraying cooling fluid onto the internal peripheral surface of said casting ring, cooling fluid guiding and separating elements arranged in spaced relationship in the space between said internal peripheral surface of said casting ring and said header and defining with said peripheral surface and said header a plurality of independent cooling sections each including at least one of said spray nozzles, said elements each comprising a metal sheet member connected at one end to said header and shaped at the other end so as to perfectly match with said internal peripheral surface of said casting ring, said sheet member having one face arranged to feed the sprayed cooling fluid substantially circumferentially onto said internal peripheral surface and an opposite face having portions arranged to diverge the oncoming stream of heated cooling fluid fed by upstream arranged spray nozzles into directions having opposite components transverse to the circumferential direction of flow of the cooling fluid on said internal peripheral surface of said casting ring.

3,971,432

DIE CASTING MACHINE

Donald Paul Hardey, 207 Sixth Ave., Sterling, Ill. 61081

Division of Ser. No. 368,505, June 11, 1973, abandoned. This application Jan. 17, 1975, Ser. No. 541,793
Int. Cl.² B22D *17/04*
U.S. Cl. 164—318 **15 Claims**



1. Die casting apparatus for applying a molding material to a die comprising:

a first conduit having an inlet and an outlet;

means for moving said first conduit to bring said outlet in communication with a die;

a second conduit having first and second ports with said first port being adapted to receive said molding material from a source of molding material;

said second port communicating with said inlet; and

means for maintaining said second port in communication with said inlet to apply said molding material to said first conduit while said first conduit is moving and said second port is stationary.

3,971,433

APPARATUS FOR MOLDING CAST IRON PARTS CONTAINING SPHEROIDAL GRAPHITE

Henri Duchenne, Vanves, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

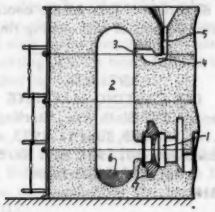
Filed Mar. 14, 1974, Ser. No. 451,196
Claims priority, application France, Apr. 20, 1973, 73.14539
Int. Cl.² B22D *27/20;* B22C *9/08;* B22D *1/00*
U.S. Cl. 164—362 **3 Claims**

1. Apparatus for casting iron parts requiring spheroidal graphite texture comprising:

a mold having a pouring channel and containing an impression of the part to be cast;

a treatment chamber disposed within the pouring channel of said mold and containing an inoculant required for the casting of said part, the volume of the portion of said treatment chamber leading to said impression of said part being equal to the sum of the volumes of said part being cast and the deadhead of said part;

said chamber being closed upon the side thereof facing said casting by means of a plug capable of being destroyed by means of the combined action of the temperature and pressure of the molten metal, said plug having a thickness and composition selected to provide a length of time said plug will resist the temperature and pressure of the molten metal charge so as to enable said volume of the portion of said treatment chamber leading to said impression of said part to be filled with said charge before said plug is destroyed; and



a separator disc, of neutral refractory material and including a cavity containing an active substance, disposed downstream of said plug;

whereby said inoculation occurs within said chamber during the time necessary for the destruction of said plug.

3,971,434

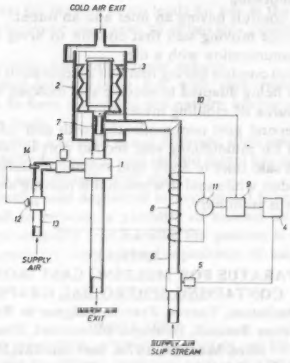
APPARATUS AND METHOD FOR OIL-IN-WAX DETERMINATION

James M. Martin, Jr.; Roy C. Heaton, both of Pasadena, and Richard H. Coe, Seabrook, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 3, 1973, Ser. No. 421,197

Int. Cl.[2] F28D *21/00*

U.S. Cl. 165—12 **5 Claims**



1. An apparatus for rapidly conditioning wax samples before determining the oil content of said samples by nuclear magnetic resonance measurement, said apparatus comprising:

a temperature equilibration chamber adapted to receive a wax sample holder designed to contain molten wax, said chamber having an inlet opening and an outlet opening for establishing a flow of gas therethrough;

a conduit communicating with the inlet opening of said equilibration chamber for supplying pressurized gas to a vortex tube;

a vortex tube attached to the base of said equilibrium chamber and having a hot air exit, and having a cold air exit in communication with said equilibration chamber for providing cold gas to said equilibration chamber to rapidly cool molten wax in said sample holder;

a conduit having heating means associated therewith and connected to the inlet opening of said equilibration chamber for conveying a heated gas to provide temperature control by mixing said heated gas with the cold gas exiting said vortex tube;

temperature measuring means operatively connected with said equilibration chamber for measuring the gas temperature in said equilibration chamber;

temperature controlling means, for operatively controlling said heating means and capable of maintaining a preselected gas temperature, and associated with said gas temperature measuring means; and

a timing relay associated with said temperature controlling means and having a solenoid activated valve located in said conduit for conveying heated gas, said relay designed to activate said heating means and to open said solenoid valve at a preset time.

3,971,435

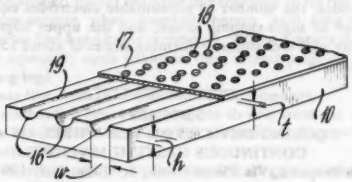
HEAT TRANSFER DEVICE

Wayne P. Peck, St. Petersburg, Fla., assignor to NCR Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 162,084, July 13, 1971, Pat. No. 3,803,688. This application Oct. 18, 1973, Ser. No. 407,478

Int. Cl. F28d *15/00*

U.S. Cl. 165—78 **21 Claims**



1. A heat-transfer device comprising a sealed container defining an enclosed space having an evaporator region and a condenser region, an internal surface of said container having a plurality of spaced elongated grooves therein and extending continuously and without obstruction through and between said regions, said grooves being of such restricted sectional dimension as to assure capillary liquid flow therethrough for a given condensable fluid selected for use therewith, and a smooth metal plate covering and continuously and integrally united to and in heat-transfer contact with said surface on both sides of and extending over each of said grooves, said plate having a plurality of openings registering with each of said grooves for communication between said grooves and the interior of said container, said openings for each groove being of lesser sectional dimension than the plate-spanned width of the groove, and said container including a condensable fluid medium in an amount sufficient to enter said grooves when condensed to a liquid and to be transported by capillary action in said grooves from the condenser region to the evaporator region of said container.

19. A heat-transfer device, comprising an elongate metal body having flat opposed sides, said body having an elongate groove open to one of said sides, and a separate elongate metal closure panel having sealed engagement to the opposed walls of the grooves, the inner surface of said panel facing and being spaced from the groove bottom, and the longitudinal ends of said engaged panel and body being sealed to close the longitudinal ends of the groove, the inner surface of said panel having longitudinal screen-wick formations, and said body having a closable port for admission of condensable liquid; said panel having a body with plural elongate grooves in the

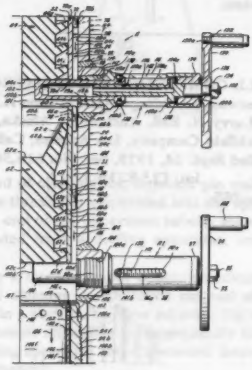
inner surface thereof, and said screen-wick formations comprising a single thin foraminated plate integrally united to the grooved inner surface and smoothly and uniformly bridging the grooves.

3,971,436

CEMENTING HEAD

William T. Lee, Harvey, La., assignor to Fishing Tools, Inc.

Filed Feb. 25, 1975, Ser. No. 552,799
Int. Cl.² E21B 33/05
U.S. Cl. 166—70 19 Claims



13. A fluid head for selective channeling of differing fluids therein directed into a tubular member, comprising:

a tubular housing having a longitudinal inner bore therethrough and adapted to be mounted longitudinally having an upper end adapted to be connected for selectively receiving differing fluids and having a lower end adapted to be connected with the upper portion of the tubular member;

primary flow control means having a longitudinal inner bore and mounted with said tubular housing for controlling fluid flow within the inner longitudinal bore of said tubular housing; and,

said flow control means being releasably supported in a first position by a releasable support means mounted with said housing providing a fluid by-pass internally of said tubular housing, and upon release thereof, said releasable support means moving out of contact with said flow control means for longitudinal movement of said flow control means to a second position in engagement with an annular seating surface in said housing for closing said fluid by-pass and thereafter directing the fluid flow therethrough said longitudinal inner bore of said flow control means.

3,971,437

APPARATUS FOR DEWATERING BOREHOLES

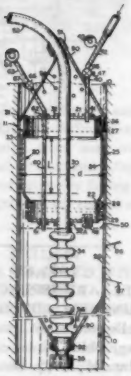
Robert B. Clay, 728 W. 3800 South, Bountiful, Utah 84010, and Lex L. Udy, 4597 Ledgement Drive, Salt Lake City, Utah 84117

Continuation-in-part of Ser. No. 531,987, Dec. 12, 1974, abandoned, which is a continuation-in-part of Ser. No. 506,175, Sept. 16, 1974, abandoned. This application Apr. 21, 1975, Ser. No. 570,011
Int. Cl.² E21B 33/12; F04F 1/06, 3/00
U.S. Cl. 166—187 6 Claims

1. Apparatus for ejecting water from flooding blasting boreholes and the like, which includes an inflatable bore-hole plugging packer body having an upper head, a lower head, and an elastic expansible peripheral wall secured in gas tight relationship to both heads, and having through said upper head an inflating and water-ejecting gas supply line of predetermined gas flow-rate capacity and a rigid water discharge pipe passing through both heads, said apparatus comprising in combination the following improvements:

a. means fixed securing both heads to said rigid discharge pipe so as to prevent relative movement between said heads when said packer body is inflated,

b. a predetermined and selectively sized open orifice for restricting gas flow in said lower head, designed to permit continuous gas flow at a rate so controlled that a build-up of pressure will occur in said body as inflating and



water-ejecting gas is supplied thereto through said gas supply line sufficient to insure holding of the body by frictional contact with a borehole wall against developing pressure below while permitting a gradual build-up of said developing pressure below to force the water in the borehole into said discharge pipe, said orifice also permitting said gas to flow through said lower head after the borehole water has been forced into the discharge pipe so as to blow water in said pipe completely out of said pipe, and

c. a substantially water-impervious borehole liner or membrane secured to said discharge pipe and lining the borehole walls below the packer body so as to substantially inhibit water in the borehole from flowing back into the formation of said borehole walls because of water-ejecting pressure in the borehole.

3,971,438

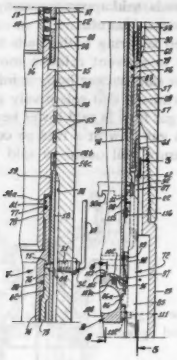
WIRELINE SAFETY VALVE WITH SPLIT BALL

Talmadge L. Crowe, Houston, Tex., assignor to Baker Oil Tools, Inc., Orange, Calif.

Filed Mar. 3, 1975, Ser. No. 554,623
Int. Cl.² F16K 11/16; E21B 43/12
U.S. Cl. 166—224 A 28 Claims

1. In a subsurface shutoff valve for wells adapted to be supported in a well fluid production pipe: a body having a flow passage therethrough; shutoff valve means including a ball valve shiftable between a first position closing said passage and a second position at which said passage is open; actuator means for shifting said ball valve between said positions, including means defining a control fluid pressure chamber for moving said ball valve to said second position, and means responsive to the pressure of well fluid in the production pipe for biasing said ball valve to said first position upon reduction in the pressure of control fluid in said chamber; said shutoff ball valve including by-pass valve means, and a passage for

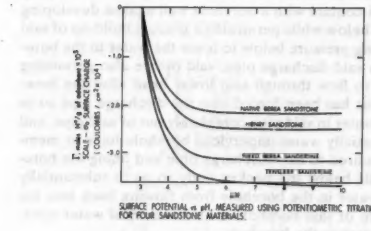
equalizing the well fluid across said shutoff valve means before said member is moved from said first position to said second position, and screen means for limiting entry of solids into said equalizing passage.



3,971,439
DESIGNING MICELLAR DISPLACEMENT SYSTEMS TO MINIMIZE ADSORPTION

Larry J. Douglas, Denver, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Mar. 31, 1975, Ser. No. 563,437
Int. Cl.² E21B *43/22, 47/00, 49/00*
U.S. Cl. 166—252 **11 Claims**



SURFACE POTENTIAL vs. pH, MEASURED USING POTENTIOMETRIC TITRATION, FOR FOUR SANDSTONE MATERIALS.

1. In a process for reducing surfactant adsorption onto rock during oil recovery operations, the steps comprising contacting the rock with a micellar dispersion which interacts on contact with the rock to render the surface potential on the rock more negative.

3,971,440
METHOD FOR TREATING SUBTERRANEAN FORMATIONS WITH CELLULOSE ETHER-POLYACRYLAMIDE AQUEOUS GELS

James E. Hessert, and Richard L. Clampitt, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 10, 1975, Ser. No. 611,751
Int. Cl.² E21B *33/138, 43/22, 43/26;* **C09K** *7/00*
U.S. Cl. 166—270 **11 Claims**

1. In a method wherein a fluid medium is introduced into a borehole in the earth and into contact with a subterranean formation penetrated by said borehole, the improvement wherein at least a portion of said fluid medium comprises an aqueous gel, and wherein said gel comprises water to which there has been added:

a water-thickening polymeric mixture of (a) at least one cellulose ether and (b) at least one acrylamide polymer wherein the amount of (a) present in the mixture ranges from about 25 to about 95 weight percent of the total amount of (a) plus (b);

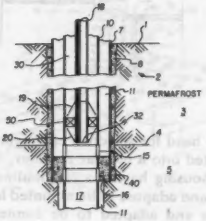
a sensible amount of a water-soluble compound of a polyvalent metal wherein the metal present is capable of being reduced to a lower valence state and which is sufficient to gel said water when the valence of at least a portion of said metal is reduced to said lower valence state; and

an amount of a water-soluble reducing agent which is effective to reduce at least a portion of said metal to said lower valence state.

3,971,441
WELL COMPLETION IN PERMAFROST

Charles R. Knowles, Anchorage, Alaska; Leon H. Miles, Plano, Tex., and Larry N. Bell, Anchorage, Alaska, assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Sept. 24, 1975, Ser. No. 616,502
Int. Cl.² E21B *33/13*
U.S. Cl. 166—285 **8 Claims**

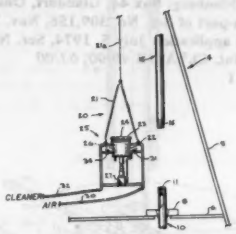


1. A method for completing a well whose wellbore passes through a permafrost zone, said wellbore containing a freezable liquid, said method providing in the permafrost zone of said wellbore a longitudinally extending first annulus having inner and outer walls, said inner wall defining a longitudinally extending interior zone, providing near the lower end of said permafrost zone spaced apart upper and lower openable and closable aperture means in said inner wall, the apertures in both said aperture means being initially closed, providing a longitudinally movable conduit means for conducting fluid from the earth's surface to the vicinity of said apertures, running said conduit means into said interior zone thereby providing a second annulus between said conduit means and said inner wall, packing off said second annulus above said upper aperture means, opening said lower aperture means, pumping a hardenable fluid through said conduit means and through said lower aperture means into said first annulus, continuing said pumping until said hardenable fluid reaches said upper aperture means, closing said lower aperture means, opening said upper aperture means, washing hardenable fluid if any out of said upper aperture means thereby leaving a hardenable annular collar in said first annulus between said upper and lower aperture means, allowing said collar to harden, and injecting into said first annulus above said collar by way of said conduit means and upper aperture means essentially nonfreezable liquid under the conditions present in said permafrost zone of said wellbore thereby substituting said essentially nonfreezable liquid for said freezable liquid in the permafrost area of said annulus.

3,971,442
METHOD OF CLEANING TUBULAR MEMBERS ON A RIG FLOOR

Thomas W. Scott, P.O. Box 51407, O.C.S., Lafayette, La. 70501

Filed Jan. 6, 1975, Ser. No. 538,748
Int. Cl.[2] E21B 23/00
U.S. Cl. 166—315 2 Claims



1. A method of cleaning the threaded pin end of a tubular member to be threadedly connected into the upwardly facing threaded box end of the uppermost tubular member of a well string suspended from a drilling apparatus, comprising the steps of:

maintaining a thread cleaner apparatus suitable for encircling and cleaning the threaded pin end of the tubular member in a standby position adjacent the rig floor, said thread cleaner apparatus being physically mounted upon said drilling apparatus for vertical and lateral movement relative thereto;

hoisting the tubular member to be cleaned into a selected position above the upwardly-facing threaded box end of the uppermost tubular member of the well string whereby the pin end of the tubular member to be cleaned faces downwardly;

moving the thread cleaner apparatus from its standby position into a selected position for cleaning the threaded pin end of the tubular member whereby the threaded pin end of the tubular member is encircled by the thread cleaner apparatus;

actuating the thread cleaner apparatus to clean the threaded pin end of the tubular member in the vicinity of the rig floor; and

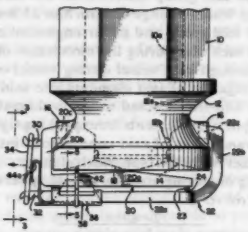
removing the thread cleaner apparatus from its cleaning position encircling the threaded pin end of the tubular member whereby the threaded pin end of the tubular member is exposed for immediate connection with the upwardly facing threaded box of the uppermost tubular member.

3,971,443
DISCHARGE HEAD HAVING DUAL FUNCTION PLUG RETAINING MEMBER

Karol R. Zenker, Needham, Mass., assignor to Factory Mutual Research Corporation, Norwood, Mass.

Continuation of Ser. No. 499,639, Aug. 22, 1974, abandoned, which is a continuation of Ser. No. 346,454, March 30, 1973, abandoned. This application June 11, 1975, Ser. No. 585,742
Int. Cl.[2] A62C 37/12
U.S. Cl. 169—39 8 Claims

1. A discharge head comprising a body member having an inlet adapted for connection to a source of fluid and an outlet for discharging said fluid, plug means; and support means for supporting said plug means relative to said body member in a position preventing the discharge of fluid from said outlet, said support means comprising a first lever disposed externally of said body member and in engagement with said plug means, a second lever connected to said body member and engaging said first lever, a fusible link connecting said levers and responsive to a predetermined temperature in the vicinity of said body member for releasing said connection, a spring loaded clip connecting said levers and responsive to a component of force of a predetermined value caused by a predetermined fluid pressure in said body member acting through said plug means and said levers, for releasing said latter connection, the

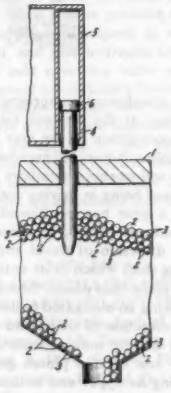


releasing of said connections permitting said plug means to be forced from said discharge preventing position by said fluid, and said fluid to discharge from said outlet, and resilient means engaging said fusible link and adapted to urge same outwardly from said levers upon the fusing of said fusible link to facilitate said release.

3,971,444
REACTION VESSELS CHARGED WITH SPHERICAL ELEMENTS

Fritz Schweiger, Hagen, and Jürgen Wohler, Uentrop, both of Germany, assignors to Hochtemperatur-Kernkraftwerk Gesellschaft mit beschrankter Haftung (HKG), Gemeinsames Europaisches, Uentrop, Germany

Continuation-in-part of Ser. No. 273,168, July 19, 1972. This application July 22, 1974, Ser. No. 490,692
Claims priority, application Germany, July 21, 1971, 2136403
Int. Cl.[2] G21C 19/00
U.S. Cl. 176—32 4 Claims



1. In a nuclear reactor, a reaction vessel, a charge of spherical reaction elements positioned in said vessel, means for providing a continuous circulation of said reaction elements through said vessel during operation thereof, a plurality of control rods and means for advancing said control rods into said charge during operation in direct contact with said elements and for retracting said control rods from said charge,

wherein the improvement comprises that said charge consists of two groups of said spherical elements, all of the elements in each of said groups being of the same diameter and the elements in each one of said groups being a different diameter from the elements in the other one of said groups, all of said elements being uniformly mixed together in said vessel and the different diameters of said groups being selected so that the diameter of one said group differs from the diameter of the other said group within a range of from 5 to 35% of the diameter of the other said group and the arrangement of the spherical elements is such that during the circulation of said spherical elements through said vessel during vessel operation the substantial segregation of said elements into said groups does not take place and the selected range in diameters prevents the charge of spherical elements from packing tightly together so that the advancement of said control rods into the charge in direct contact with the spherical elements is facilitated without causing damaging stresses to said spherical elements or to said control rods.

3,971,445

CULTIVATORS

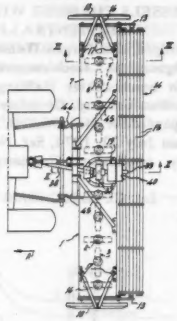
Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Continuation of Ser. No. 233,133, March 9, 1972, abandoned. This application Mar. 13, 1974, Ser. No. 450,738

Claims priority, application Netherlands, Mar. 12, 1971, 7103297

Int. Cl.² A01B *33/00*

U.S. Cl. 172—59 **12 Claims**



1. A cultivator attachment comprising a main frame beam and coupling means at the forward side of said beam, for direct and close connection to the rear of a prime mover, a plurality of rotatable soil-working members journalled on said frame beam, said soil-working members each being mounted on a rotary shaft and being in driving connection with driving means including a gear box positioned on said beam, the rotary shafts of said soil-working members extending in a row transverse to the direction of travel and said driving means including a driving shaft which in its entirety is located to the rear of a vertical plane that passes through said rotary shafts, said main beam being an elongated hollow member extending transverse to the direction of travel and housing meshed pinion gears of said driving means, each of said rotary shafts being secured to one of said pinion gears and one of said rotary shafts having its upper end in driving connection with said driving shaft, said driving shaft being connectable to a power take off of the prime mover, whereby said cultivator can be attached a minimum distance to the rear of the prime mover to improve maneuvering during operation and reduce stress during inoperative transport, said driving shaft being operatively connected to a branch shaft and the latter extending rearwardly and substantially horizontal for connection to another implement at the rear of said gear box placing same in driving connection with the same power take off that drives said soil-working members, said branch shaft projecting through an aperture in said gear box, the front of said beam being solely supported from the ground by said coupling means attached to the prime mover.

3,971,446

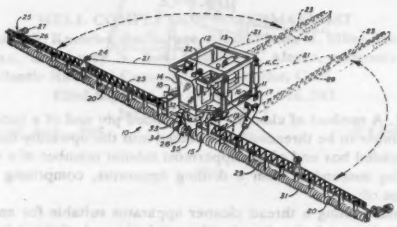
AGRICULTURAL DO-ALL MACHINE

Raymond Frank Nienberg, Box 44, Glandorf, Ohio 45848

Continuation-in-part of Ser. No. 309,156, Nov. 24, 1972, abandoned. This application July 5, 1974, Ser. No. 486,060

Int. Cl.² A01B *49/00, 63/00*

U.S. Cl. 172—311 **9 Claims**



1. An all purpose farming vehicle comprising: a power unit frame, ground engaging traction units supporting said power unit frame, an engine mounted on said power unit frame, a superstructure positioned over said power unit frame and supported by said power unit frame, a carrier arm frame having opposite hand portions on opposite sides of said power unit frame, guide means operatively positioned between said power unit frame and said carrier arm frame to restrain lateral movement of said carrier arm frame while allowing said carrier arm frame to be positioned vertically with respect to said power unit frame, means attached to said superstructure for raising and lowering said carrier arm frame relative to said power unit frame, an implement carrier arm mounted on and extending laterally from one side of said carrier arm frame, and a tension member extending between said implement carrier arm and said superstructure.

3,971,447

DRILL ROD FOR PERCUSSION DRILLING

Erik Ahlberg, Nacka; Ingvar Carlvik, Lidingo; Bernt Soren Liljekvist, and Anders Carl Gustaf Hagglund, both of Sandviken, all of Sweden, assignors to Sandvik Aktiebolag, Sandviken and Atlas Copco Aktiebolag, Nacka, both of, Sweden

Filed Dec. 3, 1974, Ser. No. 529,053

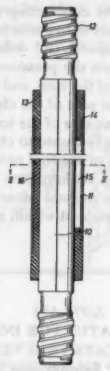
Claims priority, application Sweden, Dec. 3, 1973, 73162760

Int. Cl.² E21C *15/00*; F16F *7/00*

U.S. Cl. 173—128 **12 Claims**

1. An improved silenced drill rod for percussive drilling of the type wherein a noise-suppressing sleeve is disposed around said drill rod and extends along a major portion thereof, wherein the improvement comprises first elastomeric means (13) mounted on said drill rod (10) for substantially isolating said sleeve from said drill rod and for radially spacing said sleeve from said drill rod whereby to provide an annular space (15) therebetween, and second elastomeric means (17) in said space axially spaced from said first elastomeric means and radially substantially filling said space for damping out vibra-

tion of said drill rod, said second elastomeric means only partially filling said space whereby to permit lateral bending



of said drill rod within said sleeve during transmission of impact energy through said drill rod.

3,971,448

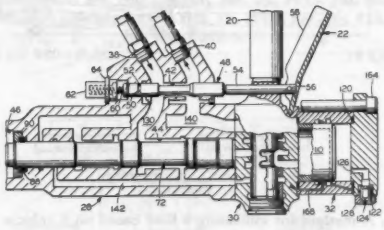
BREAKER CONSTRUCTION AND VALVE THEREFOR

Stephen Earl Crover, Boring, and Gordon Eugene Brown, Milwaukee, both of Oreg., assignors to The Stanley Works, New Britain, Conn.

Continuation of Ser. No. 394,518, Sept. 4, 1973, abandoned. This application Feb. 18, 1975, Ser. No. 550,661

Int. Cl.[2] B25D *9/20, 9/04*

U.S. Cl. 173—134 **10 Claims**



1. In a fluid operated tool operable for reciprocating linear movement of a tool member, the combination comprising:

a. a body member having a first bore extending longitudinally thereof and a second bore spaced therefrom, inlet means and outlet means formed therein, and means for detachably mounting a tool member at one end of said body member;

b. trigger means mounted on said body member for movement between an actuating position and a rest position;

c. a piston supported in said first bore of said body member for reciprocating movement in said bore between a first position adjacent said one end of said body member wherein said piston may drive the associated tool member in the direction of said one end of said body member and a second position spaced from said one end of said body member;

d. reversing valve means supported in said body member including an integral reversing valve spool supported in said second bore for movement between a first position and a second position, solely by hydraulic fluid action said spool having end faces, a passage extending therethrough between said end faces and a circumferential collar adjacent one end face providing a cross sectional area for said one face larger than that of the other end face, a radially extending circumferential collar shoulder intermediate said end facing oppositely of said one end face and providing a step up force area, said second bore being cooperatively dimensioned and configured for sliding movement of said spool therein, said second bore having an enlarged portion adjacent one end to snugly seat the portion providing said collar and collar shoulder during sliding movement of said valve spool and another portion of lesser cross sectional area to snugly seat the other end portion of said valve spool during movement thereof, said one end face providing a first force effective area and said other end face providing a second force effective area; and

e. hydraulic circuit means including conduits in said body member between said first and second bores and connecting said inlet and outlet means with said bores, said hydraulic circuit means being operable to provide alternate hydraulic circuits within said body member, said hydraulic circuit means being operable when said trigger means is in said actuating position to provide a first hydraulic circuit from said inlet means through said body member to said reversing valve spool to establish therethrough a flow path to cause hydraulic fluid to be applied to said first force effective area to produce a force thereon and hydraulic fluid to flow through said passage in said reversing valve spool and to be applied to said second force effective area to produce a force thereon wherein the resultant force produced by the hydraulic fluid acting on said first and second force effective areas causes said reversing valve spool to move to said second position thereof, said hydraulic circuit means being operable when said reversing valve spool reaches said second position thereof to establish a second hydraulic circuit from said inlet means through said body member to said position to provide a flow path therethrough to cause hydraulic fluid to be applied to said piston to produce a force thereon to move said piston to said second position thereof, said hydraulic circuit means being operable when said piston reaches said second position thereof to establish a third hydraulic circuit from said inlet means through said body member to said reversing valve spool to provide a flow path therethrough to cause hydraulic fluid to be applied to said step up force area to produce a force thereon to cause said reversing valve spool to move to said first position thereof, and said hydraulic circuit means being operable when said reversing valve spool reaches said first position thereof to establish a fourth hydraulic circuit from said inlet means through said body member to said piston to provide a flow path therethrough to cause hydraulic fluid to be applied to said piston to move said piston to said first position thereof wherein said piston is driven towards said one end of said body member and may thereby drive an associated tool member.

3,971,449

PROCEDURE FOR CONTROLLING A ROCK DRILL AND ROCK DRILL FOR CARRYING OUT THE PROCEDURE

Roger Nylund, and Aulis Holmala, both of Tampere, Finland, assignors to Oy Tampella AB, Tampere, Finland

Filed Oct. 9, 1974, Ser. No. 513,291

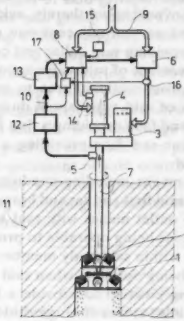
Claims priority, application Finland, Oct. 9, 1973, 3133/73; Oct. 1, 1974, 2869/74

Int. Cl.[2] E21B *19/08*

U.S. Cl. 175—27 **18 Claims**

1. A method for controlling the drilling functions of a full profile rock drill apparatus, comprising the steps of controlling the speed of rotation of the cutting head and controlling the feed force of the cutting head so that the rate of penetration of the drill bit reaches its optimum rate as a function of

the feed force, said full profile drilling apparatus having a part of the cutting head cutting the rock comprising freely rotable cutters, measuring during the drilling operation the change of the rate of penetration of the cutting head into the rock, and controlling on the basis of said measured change the drilling functions so that the cutting head feed force is either increased or decreased, said feed force of the cutting head being



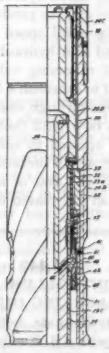
controlled so that if the nearest preceding control action for increasing or decreasing the feed force has increased the rate of penetration of the cutting head then the feed force of the cutting head will be adjusted in the same direction as the nearest preceding adjustment, if the rate of penetration, on the other hand decreased or remained at the same level then the feed force of the cutting head is adjusted in the opposite direction.

3,971,450

WELL DRILLING TOOL

Fred K. Fox, Houston, Tex., assignor to Engineering Enterprises, Inc., Houston, Tex.

Filed Jan. 31, 1975, Ser. No. 546,006
Int. Cl.² E21B *3/12*
U.S. Cl. 175—107 **38 Claims**



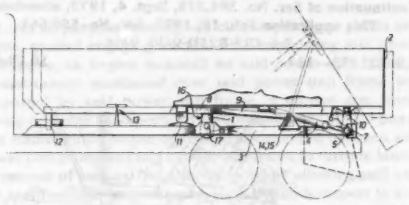
1. A well drilling tool adapted to be connected to the lower end of a drill string above the drill bit, whereby drilling fluid may be circulated downwardly through the inside of the tool and upwardly within the annulus between the outside of the tool and the bore of the well being drilled, comprising inner and outer members defining an annular space therebetween, means on the members within said space supporting them for rotation with respect to one another, first means sealing between said members for separating the fluid on one side of said tool from that within a portion of said space, means providing a variable volume lubricant chamber including second and third sealing means between said members within the space portion, and means fluidly connecting the other side of the tool with said space portion above and below said second and third sealing means, respectively, whereby said first seal means is adapted to contain the pressure differential between the inner and outer sides of the tool, and said second and third sealing means separate the part of the chamber between them from the fluid on said other side of the tool, the volume of said chamber being variable in response to changes in the pressure of fluid on said other side of the tool near said chamber, so as to maintain the pressure of lubricant within the chamber substantially equal to that on said other side of the tool, and thereby protect parts contained within said chamber for said drilling fluid.

3,971,451

METHOD AND APPARATUS FOR INDICATING A LOAD PLACED ON A LOAD-CARRYING VEHICLE PLATFORM

Carl Eric Bertil Norberg, Setunavagen 24 D, 195 00 Marsta, Sweden

Filed July 14, 1975, Ser. No. 595,576
Claims priority, application Sweden, Oct. 1, 1974, 7404903
Int. Cl.² B60P *5/00*; G01G *19/08*
U.S. Cl. 177—1 **13 Claims**



1. A method for indicating a load based on a vehicle platform which is supported on a vehicle, comprising:

providing a balancing member (16) on the vehicle and disposed at the theoretical center of gravity of the vehicle load;

relieving at least a portion of the vehicle platforms normal supporting points during load indication by means of said balancing member (16);

providing a first sensing and transmitting means (5, 6) spaced from said balancing member (16);

relieving the vehicle platforms other normal supporting points during load indication by means of said first sensing and transmitting means (5, 6);

sensing, by means of said first sensing and transmitting means (5, 6), a torque about said balancing member (16) caused by application of a load on the vehicle platform (2) and delivering a signal which is a function of said sensed torque; and

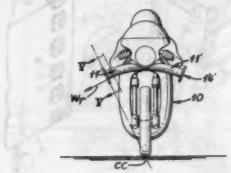
displacing said platform (2) and therefore the center of gravity of the load placed thereon, as a function of said signal, towards and so as to substantially coincide with the theoretical center of gravity of the vehicle load on the vehicle platform (2).

3,971,452

AERODYNAMIC DEVICE FOR IMPROVING THE HIGH SPEED RUNNING CONDITIONS OF MOTORCYCLES

Alberto Morelli, Strada val Salice, 72, Turin, Italy

Filed Apr. 29, 1975, Ser. No. 572,847
Claims priority, application Italy, May 2, 1974, 68361/74
Int. Cl.[2] B62D 37/02
U.S. Cl. 180—1 FV 16 Claims



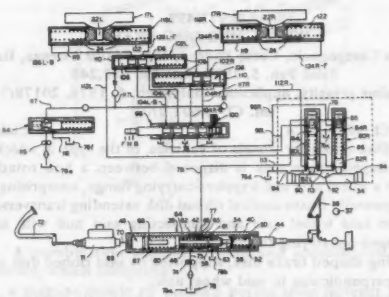
1. An aerodynamic device for improving the high speed running conditions of motorcycles, comprising a negative lift airfoil constrained on the motorcycle body, independently of any steering member, said airfoil including means to produce a negative lifting action approximately in the vertical plane passing through the pivot axle of the front wheel; said negative lift airfoil being fitted in a leading zone of the motorcycle body ahead of the barycentrical straight line such that said airfoil originates a diving barycentrical moment in relation to the motorcycle's barycenter in every point of said leading zone.

3,971,453

HYDROSTATIC CONTROL - PIVOT STEERING

Jon Richard Patton, and Ronald Loren Sisson, both of Jackson, Mich., assignors to Clark Equipment Company, Buchanan, Mich.

Division of Ser. No. 326,440, Jan. 24, 1973, Pat. No. 3,888,323. This application Oct. 29, 1974, Ser. No. 518,405
Int. Cl.[2] B62D 9/00
U.S. Cl. 180—6.48 10 Claims



1. In a pivot steering vehicle,

a pair of hydrostatically operated driving wheels,

means for driving the driving wheels including a pump and a motor for each wheel, the pump providing driving power and the motor including a control element for controlling the speed and direction of the wheel as driven by the pump, and the control elements being independently actuatable for correspondingly independently controlling the wheels as to speed and direction,

steerable wheels and a steering wheel for actuating them and steering the vehicle,

a fluid line leading to each control element,

means for producing pressure in the fluid in the fluid lines and transmitting the pressure to the central elements,

first control means independent of the steering wheel and including an accelerator valve, the accelerator valve including a cylinder and spool means therein, and

the spool means including a main spool operative for closing and opening the fluid lines, the main spool being provided with a hollow interior and a port therefrom providing access of the fluid in the fluid lines to enter into the interior of the main spool,

the main spool including a main portion and a second portion movable relative to the first, the second portion being positioned for reaction thereagainst by the pressure of the fluid in the interior of the main spool,

manually actuatable means for actuating the spool means, and thereby actuating the accelerator valve,

the accelerator valve being operable, in response to actuation of the spool means, for controlling the transmission of pressure in the fluid lines, throughout a predetermined range of variation of pressure to the motors in proportion to the degree of actuation of the manually actuatable means and correspondingly driving the driving means at corresponding speeds,

the motors being effective for establishing corresponding reaction pressure through the fluid to the spool means and thereby the manually actuatable means, whereby to enable the operator to sense the pressure being applied to the central elements,

the spool means and manually actuatable means being so relatively positioned and constructed that the manually actuatable means acts against the second portion of the main spool means and hence the pressure of the fluid reacts against the second portion of the main spool means and thereby against the actuatable means,

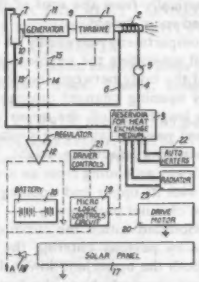
said control means due to its independence of the steering wheel being operative for controlling the motors throughout the full range regardless of the condition of steering or any position of the vehicle due to steering.

3,971,454

SYSTEM FOR GENERATING ELECTRICAL ENERGY TO SUPPLY POWER TO PROPEL VEHICLES

Nelson J. Waterbury, 400 Coconut Row, Palm Beach, Fla. 33480

Continuation-in-part of Ser. No. 135,551, April 20, 1971, abandoned. This application Apr. 13, 1973, Ser. No. 350,944
Int. Cl.[3] B60L 11/12
U.S. Cl. 180—65 R 12 Claims



1. An electric-powered vehicle having wheels driven by at least one electric drive motor; a battery consisting of a multiplicity of cells electrically connected to the or each motor for supplying power thereto; control means for regulating the supply of power from the battery to the or each drive motor; at least one bank of solar cells mounted on the vehicle in such a position as to be exposed to solar radiation during sunlight

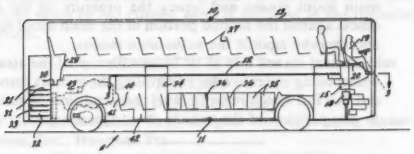
hours; means electrically connecting the or each bank of solar cells to the battery, said means including isolating means for protecting the solar cells against reverse current from the battery; an electrical generator adapted to supply charge to the battery; an intermittently operating gas turbine drivingly connected to the generator for operating the same; a heat exchanger adapted to receive hot waste gases from said turbine and transfer heat to a heat exchange medium circulating therein; a free-wheeling turbine drivingly connected to the generator; conduit means for supplying heated heat exchange medium in gaseous form to the free-wheeling turbine and for returning heat exchange medium therefrom to the heat exchanger; and a voltage regulator interpositioned between the generator and the battery for controlling the flow of charge to the battery, said voltage regulator having freedback means for controlling the operation of the first-mentioned turbine and of the generator in accordance with the charge existing on the battery.

3,971,455

DOUBLE DECK BUS

William R. Molzon, Rancho Palos Verdes, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed Sept. 17, 1975, Ser. No. 614,341
Int. Cl.² B60J 9/02; B62D 31/04
U.S. Cl. 180—89 R **9 Claims**



1. A double deck bus having a body with a front entrance and two rear exits, said bus comprising:

a lower deck terminating short of the rear end of the body,

an upper deck extending substantially the full length of the body and spaced vertically from the lower deck by selected standing head room height, the upper deck being spaced vertically from the roof of the body by selected sitting head room height,

an engine compartment rearwardly of the lower deck,

a sealed wall separating the engine compartment from the interior of the body between the decks,

an upwardly opening channel passageway formed in, and extending lengthwise of, the upper deck, the bottom of the channel passageway being spaced from the roof by selected standing headroom height,

a curved stairway ascending from an area adjacent the front entrance with its upper end opening into a forward portion of the channel passageway,

a fare box mounted within the curve of the front stairway for access by persons entering the front entrance and going to both the upper and lower decks,

a driver's seat elevated above the lower deck at a height, and so located, as to provide for monitoring of the fare box by a driver seated in the driver's seat,

a second stairway descending from the rear end of the channel passageway to one of the rear exits, and

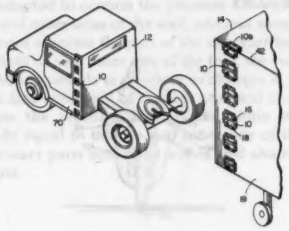
a passageway along the lower deck, said lower deck passageway being offset laterally from the upper deck channel passageway, and extending from an area adjacent the fare box to the other rear exit.

3,971,456

HANDLE-RUNG MODULE

Everett R. Yonce, 464 42nd St., Oakland, Calif. 94609

Filed Apr. 10, 1975, Ser. No. 566,952
Int. Cl.² B60R 3/00
U.S. Cl. 182—90 **7 Claims**



1. A handle rung module adapted for attachment in an aperture in a pre-existing structure comprising:

a. a longitudinal segment of arcuate contour having arcuate end edges and parallel straight side edges;

b. two substantial parallel end walls each having an arcuate edge portion joined to the arcuate edges of the longitudinal segment at opposite ends of said longitudinal segment;

c. a longitudinally extending cross member centrally spanning the length of the longitudinal segment, said cross member having ends connected to said end walls proximate to a midpoint on said peripheral edge portion of said end walls; said cross member further having a flat surface and an arcuate surface concentric with said arcuate contour of said longitudinal segment and forming a straight edge longitudinally of said cross member; said flat surface facing outwardly from said arcuate longitudinal segment and;

d. means at the straight edges of said longitudinal segment and said peripheral edge portions of said end walls attachable to the surface of a pre-existing structure for mounting the module within an aperture in the surface of a pre-existing structure with said longitudinal segment recessed in said surface.

3,971,457

WHEEL HUB DISC BRAKE

Tullio Campagnolo, Corso Padova, 168, 36100 Vicenza, Italy

Filed Feb. 5, 1975, Ser. No. 547,249
Claims priority, application Italy, Feb. 5, 1974, 20178/74
Int. Cl.² B60T 1/06
U.S. Cl. 188—18 A **2 Claims**

1. Disk brake for wheels of vehicles, of the type in which a ring-shaped brake disk is disposed between a hub rotating about a wheel axle and a spokes-carrying flange, comprising:

a generally frusto-conical ribbed disk extending transversely to said wheel axle and connecting said hub with said spokes-carrying flange;

a ring-shaped brake disk, supported by said ribbed disk and perpendicular to said wheel axle;

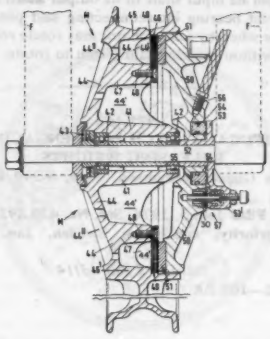
a brake plate, mounted on said wheel axle, beside said ribbed disk, and parallel to said ring-shaped brake disk, said brake plate being axially movable but locked against rotation;

an annular friction pad assembly on the periphery of said brake plate and adapted to engage said ring-shaped brake disk when the brake plate is driven toward said ribbed disk;

fluid pressure control means, acting on said brake plate, for driving the same toward said ribbed disk, and comprising a circular recess forming a cylinder on the outer central part of the brake plate, and means for feeding said cylinder with brake fluid; an annular piston in said recess; and

a radial flange opposing said piston and forming part of a bush, fitted onto the wheel axis and on which is axially slidably mounted said brake plate;

and return means to move said brake plate away from said ribbed disk, comprising a plurality of adjustable devices,



automatically taking up slack and uniformly distributed about the periphery of said radial flange, each said device comprising a spring tied to said plate and a pin projecting parallel to the wheel axle from said flange and extending into the plate containing the spring so as to be held by the latter in frictional engagement.

3,971,458

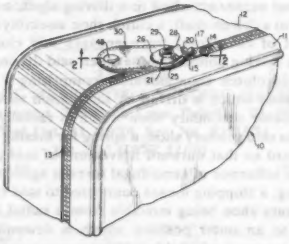
COMBINATION IDENTIFICATION CARD HOLDER AND LUGGAGE LOCK

Stanley Koenig, Englishtown, N.J., assignor to Atlantic Products Corporation, Trenton, N.J.

Filed Jan. 6, 1975, Ser. No. 538,745

Int. Cl.² A45C 3/00; A44G 19/36

U.S. Cl. 190—41 Z 7 Claims



1. A combination luggage closure and identification tag assembly, which comprises

a. a luggage article or the like having slide fastener type closure means,

b. said slide fastener including a pair of opposed slide elements,

c. an identification tag member swingably connected to one of said slide elements and serving as a pull tag therefor,

d. a latch member swingably carried by the other of said slide elements and serving as a pull tag therefor,

e. latch receiving means on said identification tag member for receiving and engaging with said latch member for lockingly securing said slide elements in adjacent relationship to retain said slide fastener in its closed position, and

f. cooperating snap fastener means on said identification tag member and on said luggage article,

g. said snap fastener means being engageable, when said latch member and latch receiving means are engaged, to releasably retain said identification tag member in a predetermined position on said luggage article.

3,971,459

HOUSING, INCLUDING READILY REMOVABLE PROTECTIVE PLATES, FOR MONORAIL ELECTRICAL COMPONENTS

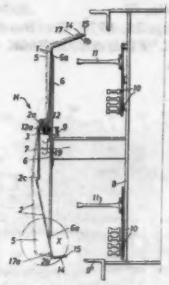
Klaus Becker, and Hartwig Sprung, both of Wetter, Germany, assignors to Demag Aktiengesellschaft, Duisburg, Germany

Filed Jan. 13, 1975, Ser. No. 540,693

Claims priority, application Germany, Jan. 15, 1974, 2401642

Int. Cl.² B60M 1/04

U.S. Cl. 191—30 16 Claims



1. A housing for a monorail girder mounting electrical rails, said housing including

a. cantilever bracket means supporting a plurality of vertical support plates from said girder;

b. an elongated longitudinally extending profile rail mounted to said support plates proximately of said electric rails;

c. one horizontal longitudinal edge of each of said plates being tightly connected to said profile rail; and

d. the other horizontal longitudinal edge of each of said plates being loosely connected with said support

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3,971,460

APPARATUS FOR ELECTRICALLY CONNECTING TWO CONDUCTORS BETWEEN TWO ROTATABLE ELEMENTS

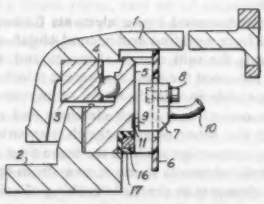
Guillaume Antonin Gay-Chatain, and Paul Rene Marius Montjallard, both of Saint-Etienne, France, assignors to Etat Francais, Paris, France

Filed Feb. 27, 1975, Ser. No. 553,547

Claims priority, application France, Mar. 5, 1974, 74.07348

Int. Cl.² H01R 39/64

U.S. Cl. 191—45 R 10 Claims



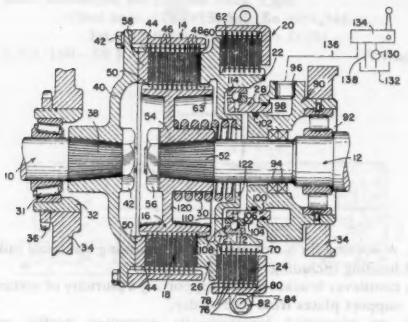
1. Electrical connection apparatus for two conductors respectively connected to an electrical supply source and to a utilization device, the conductors being respectively secured

to first and second elements which are relatively rotatable with respect to one another through the intermediary of a roller bearing having a cage constituted by first and second parts respectively secured to said first and second elements and balls inserted in said cage, said apparatus comprising first and second conductive contacts fixedly secured to said first element, an annular grounding track on which said first contact is in sliding contact, an annular conductive track on which said second contact is in sliding contact, said conductive track and said grounding track being secured to said second part of the cage.

3,971,461
AXIALLY COMPACT CLUTCH AND BRAKE MECHANISM

William E. Conroy, Aurora; Charles C. Ehlke, Decatur, and Peter Sidles, Jr., Oswego, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 28, 1974, Ser. No. 501,240
Int. Cl.² F16D 67/02; B60K 41/24
U.S. Cl. 192—18 A **6 Claims**

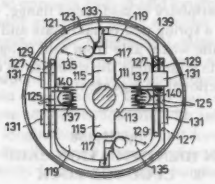


1. An axially compact clutch and brake mechanism comprising:
- a rotatable input shaft adapted to be driven;
- a rotatable output shaft coaxial with said input shaft and adapted to be selectively driven or braked;
- a first clutch element carried by said first input shaft;
- a second clutch element aligned with said first clutch element and carried by said output shaft;
- said first and second disc-like clutch elements being mounted for relative axial movement towards and away from each other to effect a selective driving connection between said shafts;
- a first brake element carried by said output shaft;
- a second brake element aligned with said first brake element and adapted to be affixed against rotation;
- said first and second disc-like brake elements being mounted for relative movement towards and away from each other whereby said output shaft may be selectively braked;
- said first and second brake elements further being axially spaced from said first and second clutch elements;
- an actuator for said clutch elements and said brake elements mounted for axial movement relative to said shafts and operable in one direction of movement thereof to engage one of said clutch elements and move the same toward the other of said clutch elements to effect the driving connection while at the same time allowing one of said brake elements to move away from the other of said brake elements to preclude braking of said output shaft, and in another direction of movement to cause the reverse to occur;
- a piston for axially shifting said actuator, said piston being concentric to one of said shafts and located radially inwardly with respect to said shafts of one of said first and second clutch elements and said first and second brake elements, said piston further being non-axially spaced from said one of said first and second clutch elements and said first and second brake elements;
- whereby said clutch and brake mechanism is axially compact from its input shaft to its output shaft;
- and a thrust bearing interconnecting said piston and said actuator whereby said actuator may rotate relative to said piston without causing said piston to rotate.

3,971,462
CENTRIFUGAL CLUTCH WITH ENGAGING AND RELEASING WEIGHTS

Rolf Anders Gunnar Johansson, Vare, S-310 83 Unnaryd, Sweden

Filed Jan. 3, 1974, Ser. No. 430,592
Claims priority, application Sweden, Jan. 12, 1973, 7300425
Int. Cl.² F16D 43/14
U.S. Cl. 192—105 BA **21 Claims**



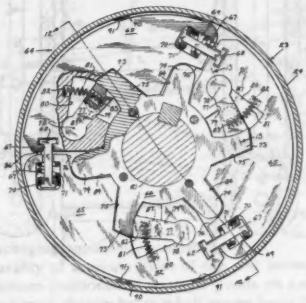
1. An arrangement for a centrifugal clutch comprising a clutch shoe center attached to a driving shaft, a clutch drum attached to a driven shaft, a clutch shoe assembly which under the effect of centrifugal force engages said clutch drum to provide a driving connection between said driving and driven shafts, said clutch shoe assembly comprising a radial inner primary shoe which is driven by said clutch shoe center and a radial outer secondary shoe which is radially movable in relation to said primary shoe, a spring for biasing said primary shoe inward so that outward movement of said primary shoe under the influence of centrifugal force is against the force of said spring, a stopping means connected to said clutch center, said primary shoe being movable from a radial inner release position to an outer position which is determined by said stopping means, a releasable locking means arranged between said primary shoe and said secondary shoe which, in a first position, permits operative contact of said secondary shoe with said primary shoe in a radial outer working position and in which said secondary shoe, under the influence of centrifugal force acting on said primary shoe presses against said clutch drum to transmit torque from said driving shaft to said driven shaft, means for actuating said locking means to a second position which releases said secondary shoe, in which position said secondary shoe are allowed to move mutually radially, the radial dimension of said secondary shoe being less than the distance between said primary shoe in its outer position and said clutch drum, said distance being measured at said secondary shoe, whereby, when said locking means and said secondary shoe are released, the centrifugal force acting on said primary shoe is taken up by said clutch center while said secondary shoe lies free from said clutch drum or is pressed against said drum by, at most, only the centrifugal force acting in said secondary shoe.

3,971,463

PROGRESSIVELY ENGAGED CENTRIFUGAL CLUTCH

Hugh A. Zindler, 11407 Cedar Creek Road, Cedarburg, Wis. 53012

Filed May 14, 1975, Ser. No. 577,336
Int. Cl.² F16D 43/14
U.S. Cl. 192—105 BA 19 Claims



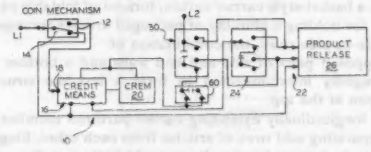
1. In a centrifugal clutch for transmitting torque between an inner driving member and an outer driven member, a plurality of circumferentially spaced shoes interposed between the driving and driven members, spring means connecting the ends of adjacent shoes and biasing the shoes inwardly onto the driving member and out of engagement with the driven member, said shoes being movable against the bias of said spring means in response to centrifugal force to effect a driving engagement with the driven member, a plurality of circumferentially spaced projections extending outwardly from the driving member for engagement with each shoe, and means between the driving member and each shoe and providing for successive engagement between each said shoe and the corresponding projections with increasing increments of speed, the successive engagement between said shoes and the corresponding projections providing for progressively increasing torque transmitting capability up to the maximum torque load of the clutch.

3,971,464

CONTROL MEANS FOR A VENDING MACHINE

Gordon F. Seversen, 245 Park Lane, Palatine, Ill. 60067

Filed Oct. 31, 1974, Ser. No. 519,574
Int. Cl.² G07F 11/00
U.S. Cl. 194—10 29 Claims



1. A control system for a vending machine comprising:

means for producing a credit signal after a predetermined legal tender is accepted by the machine;

a credit means having an off-condition and a credit-condition, said credit means being switched to the credit-condition after said credit signal is generated, said credit means preventing acceptance of said legal tender when in the credit-condition;

product select switch means having an off-position and a select-position;

product release means having an activated state and a de-activated state, the switching of the product select switch from the off to the select-position when the credit means is in the credit-condition causing said product release to switch to said activated state from the de-activated state for releasing the product during a vend cycle; and

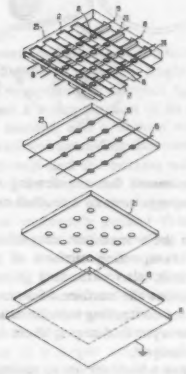
a vend switch having a credit-position and a vend-position, said vend switch in the credit-position providing an electrical path for electrical power to the credit means when the credit means is in the credit-condition, said vend switch severing said electrical path to the credit means when switched to the vend-position, said vend switch in the vend-position providing an electrical path for electrical power to the product release means.

3,971,465

SELF-SCANNING ELECTROSTATIC PRINT HEAD FOR A DOT MATRIX PRINTER

Robert E. Benn, Broomall, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Nov. 27, 1974, Ser. No. 527,909
Int. Cl.² B41J 3/18
U.S. Cl. 197—1 R 9 Claims



1. In an electrostatic printer, a dot matrix electrostatic print head system for cyclically generating a continuous self-scanning ionization pattern, generating therefrom a selective ionization pattern in synchronization with the self-scanning pattern, and depositing the selective ionization pattern onto electrostatic paper, the print head system comprising:

a planar electrode for supporting the back of electrostatic paper;

a set of parallel printing anodes in a plane juxtaposed in parallel to the front surface of the electrostatic paper a set of apertured parallel cathodes in a plane juxtaposed in parallel to the front surface of the electrostatic paper, the cathode plane being further removed from the paper than the printing anode plane, said set of cathodes being orthogonal to said set of printing anodes, and the cathode apertures being aligned with the apparent intersections of said set of cathodes and said set of printing anodes;

a set of parallel scanning anodes in a plane juxtaposed in parallel to the front surface of the electrostatic paper, the scanning anode plane being further removed from the paper than the cathode plane, said set of scanning anodes being parallel to said set of printing anodes and aligned with the apertures in said set of apertured cathodes;

scanning means for cyclically transferring aperture-by-aperture ionization between said set of scanning anodes and set of apertured cathodes;

selective pattern generating means synchronized with said scanning means for selectively transferring a pattern of

ionization through the apertures in said set of cathodes to said set of printing anodes; and

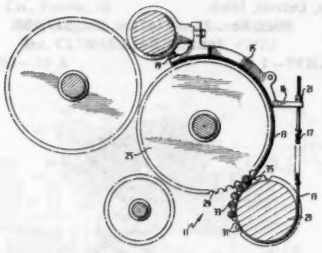
potential referencing means cooperating with said planar electrode for attracting the selective ionization pattern from said printing anodes through the electrostatic paper to said planar electrode thereby causing the selective pattern to be deposited on the electrostatic paper.

3,971,466

BELT TRANSFER MEANS FOR CIGARETTES OR THE LIKE

James S. Hurt, Rte. No. 2, P.O. Box 208, Ashland, Va. 23005

Filed Apr. 10, 1974, Ser No. 459,626
Int. Cl.² B65G *47/00*
U.S. Cl. 198—20 C **18 Claims**



1. A transfer means for transferring tubular articles from one moving conveyor unit to a second moving conveyor unit, comprising:

a non-driven belt member extending at least partially around a transporting surface of a transferee moving conveyor unit, also extending in reverse wind at least partially across the surface of a transferor moving conveyor unit for contacting tubular articles on the transferor moving conveyor and urging them toward the transferee moving conveyor;

a guide bracket which serves to maintain the belt member in operable position, so that articles are transferred by the belt member from a transporting surface of said transferor moving conveyor unit to said transporting surface of said transferee moving conveyor unit; and

a biasing member for lengthwise tensioning said non-driven belt member and thereby urging said non-driven belt member toward said transporting surface of said transferee moving conveyor unit.

3,971,467

CONVEYOR ASSEMBLY FOR MOVING ARTICLES

Andrew W. Anderson, West Caldwell, N.J., assignor to Scandia Packaging Machinery Company, Clifton, N.J.

Filed Feb. 4, 1975, Ser. No. 547,065
Int. Cl.² B65G *15/06, 15/20*
U.S. Cl. 198—164 **10 Claims**

1. In a packaging machine, the combination comprising:

a. means for moving at least one article along a path to an article receiving station, and

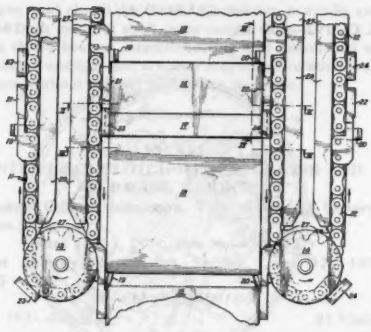
b. means for receiving said article at said receiving station,

c. said moving means including a conveyor means, stabilizing means and pushing means,

d. said stabilizing means and said pushing means being disposed on the conveyor means to travel in a forward direction for effecting controlled movement of the article along said path,

e. said pushing means being effective to engage the following side of the article for moving the article into the receiving station,

f. said stabilizing means at corresponding locations along each side of said path and being effective to engage opposing sides of the article for maintaining a predetermined alignment of the article while the article is moved away from the article moving means into the receiving station.

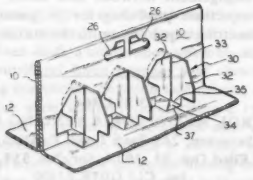


3,971,468

CARTON PARTITION ARRANGEMENT

Charles R. Helms, Barto, and William D. Patrick, Audubon, both of Pa., assignors to Container Corporation of America, Chicago, Ill.

Filed July 11, 1975, Ser. No. 595,058
Int. Cl.² B65D *75/08, 85/62*
U.S. Cl. 206—193 **6 Claims**



1. In a basket-style carrier carton, formed of foldable paperboard, for holding a plurality of packaged articles arranged in two side-by-side rows, the combination of:

a. opposed pairs of side and end walls and a bottom wall hingedly interconnected to form a box-like structure open at the top;

b. a longitudinally extending center partition member, for separating said rows of articles from each other, hingedly attached to said end walls and said bottom wall;

c. a plurality of transversely extending partition members, for separating the articles of each row from each other, each comprising:

i. a vertical divider element having one side edge hingedly attached to said center partition member and extending in a direction normal to said center partition member;

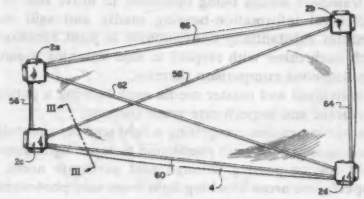
ii. a horizontal gusset element having one edge hingedly attached to said bottom wall and having another edge hingedly attached to a lower edge of said vertical divider element and being operable to maintain said vertical divider element in position when the carton is in erected condition.

3,971,469

PACKAGING APPARATUS

John L. Harris, Bettendorf, Iowa, and Bror H. Nelson, Moline, Ill., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed July 31, 1974, Ser. No. 493,383
Int. Cl.² B65D 85/48
U.S. Cl. 206—452 13 Claims



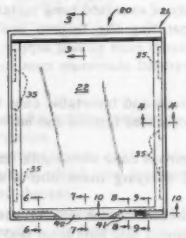
1. A packaging apparatus, comprising
1. a plurality of separate pairs of top and bottom bearing half means positioned at strategic points on a material to be packaged, the top bearing half means being for bearing against a top portion of the material to be packaged, the bottom bearing half means being for bearing against a bottom portion of the material to be packaged,
2. tightenable connecting means, extending between each pair of the top and bottom bearing half means at each of said points, for holding the top and bottom bearing half means at each point in bearing relationship against respectively a top portion and a bottom portion of the material to be packaged, and
3. line means extending between each of said points and tied to the bearing half means for securing them in position on the material to be packaged.

3,971,470

X-RAY CASSETTE FILM HOLDER

Velton C. White, V. C. Labs, Inc., 17 N. Broadway, Des Plaines, Ill. 60016

Continuation of Ser. No. 351,327, April 16, 1973, abandoned. This application Sept. 26, 1974, Ser. No. 509,553
Int. Cl.² B65D 85/48
U.S. Cl. 206—455 18 Claims



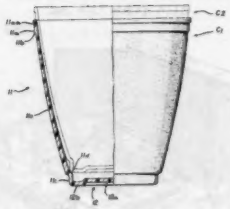
1. A cassette for holding film and the like having a separable hinge, comprising tray means having at one end an inflexible overhanging lip member and a recess of substantially uniform cross-sectional shape extending across the end of said tray means to provide a continuous, uniform closing pressure and lid means having at one end an inflexible ridge member of substantially uniform arcuate cross-sectional shape extending across the end of said lid means and projecting above the top surface of the lid means and formed to fit within said tray means recess for engagement with the overhanging lip member of the tray to cam the adjacent lid end at least partially into the tray means when the lid means and tray means are closed.

3,971,471

CLOSE-NESTING, LIGHT-WEIGHT, ONE-PIECE DRINKING CUP AND APPARATUS FOR THE MANUFACTURE THEREOF

Rodney E. Ludder, Glen Head, N.Y., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Apr. 16, 1973, Ser. No. 351,561
Int. Cl.² B65D 21/02, 1/16
U.S. Cl. 206—519 5 Claims



1. A one-piece, seamless drinking cup of nestable configuration, and of a size adapted to contain a single serving of a hot beverage, said cup comprising a sidewall tapering inwardly and downwardly over a major portion of its extent from the upper open mouth thereof, and a bottom wall formed integrally with the sidewall and extending thereacross at the lower end thereof, the sidewall and the bottom wall being formed from fused beads of an expanded thermoplastic material, which consists essentially of general purpose polystyrene whose density is not materially greater than 5 pounds per cubic foot, the sidewall gradually increasing in thickness over said major portion, as it extends downwardly thereof, said major portion extending from a first elevation near the upper open mouth of the cup to a second elevation near the lower end thereof and gradually increasing in its angle, relative to the vertical central axis of the cup, from a small acute angle at the first elevation to a larger acute angle at the second elevation to maintain adequate, but not excessive, clearances between all portions of the overlapped major portions of the sidewalls of a pair of such cups closely nested together, said cup being circular in horizontal cross-section at all elevations along said major portion, the ratio of the overall height to the outside diameter of the upper open mouth of said cup being of the order of 1.05, the thickness of said major portion of the sidewall at the second elevation being of the order of 2.0 times the thickness at the first elevation, and the inside surface of the major portion, along a vertical plane on which the vertical central axis of the cup lies, corresponding to the shape of an arc of a circle whose radius is of the order of 4.7 times greater than the outside diameter of said upper open mouth of the cup, the distance from the upper open mouth of the cup to the first elevation and the distance from the second elevation to the lower end of the cup each being equal to the desired stacking height between like cups closely nested together, the sidewall of said cup being provided with a thickened portion which extends for the length of such distance from the upper open mouth of the cup to the first elevation and which defines a horizontally outwardly projecting shoulder which is adapted to rest on the upper open mouth of a like cup when such cup is inserted in said like cup in closely nested relationship, the sidewall of the cup also being provided with a radially inwardly offset vertical section which extends for the length of the distance from the second elevation to the lower end of the cup and which defines a horizontally inwardly projecting shoulder on which the lower end of a like cup is adapted to rest when said like cup is inserted in said cup in closely nested

relationship, the thickness of the sidewall at the first elevation being not materially greater than 0.045 in., the distance from the upper open mouth of the cup to the first elevation being no greater than ⅝ inch.

3,971,472

CARTON WITH CLAMPING STRIP

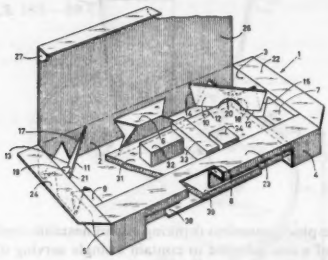
Jan Aalbert Veenman, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 27, 1975, Ser. No. 553,534

Claims priority, application Netherlands, Mar. 4, 1974, 7402869

Int. Cl.² B65D *81/00*, *85/30*

U.S. Cl. 206—521 3 Claims



1. A carton comprising a planar bottom plate and side walls formed from a sheet of material folded at edges of said bottom plate, wherein said carton further comprises an oblique corner strip formed by a portion of said sheet of material, said corner strip comprising a base and edges, said strip being cut from said sheet along said edges and folded along said base out of the plane of the bottom plate, said base extending between two adjacent side walls and two edges, each of said two edges bearing against a respective one of said two adjacent side walls, said strip extending inwardly and upwardly from the base so as to enclose an angle greater than 45° and less than 90° with respect to the plane of the bottom plate.

3,971,473

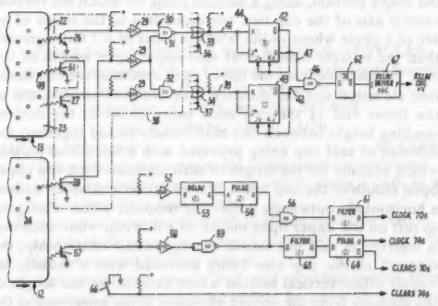
TRI-LEVEL SELECTOR

Franklin Henry Ernst, Jr., 631 Tennessee St., Vallejo, Calif. 94590, and Martin N. Nelson, 20326 Cohasset St., Canoga Park, Calif. 91304

Filed June 17, 1974, Ser. No. 480,228

Int. Cl.² B07C *3/10*; G06K *9/00*

U.S. Cl. 209—73 24 Claims



1. A device for selection among a plurality of individual information-bearing media, comprising

transport means for moving individual information-bearing media through a scanning station,

a master indicia-bearing medium for specifying the characteristics of the individual information-bearing media to be selected,

scanning means adjacent said scanning station and comprising a plurality of sensors, said scanning means being responsive to the characteristics of individual information-bearing media as compared with said master medium to detect those individual information-bearing media appropriate for selection and issue a select signal upon such detection,

said transport means being operative to move one of said individual information-bearing media and said master medium substantially continuously in joint synchronism with each other with respect to said scanning means for simultaneous comparison thereby,

said individual and master media each bearing a pattern of perforate and imperforate areas thereon,

said scanning means comprising a light source, a plurality of photosensitive devices positioned to sense light from said light source passing through said perforate areas, said imperforate areas blocking light from said photosensitive devices, and a three-state logical comparator circuit receiving signals from said photosensitive devices and comparing said signals to select among three identifications of the individual information-bearing medium being scanned, the three identifications being those media to be positively selected, those media to be positively rejected, and those media to be rejected by default.

3,971,474

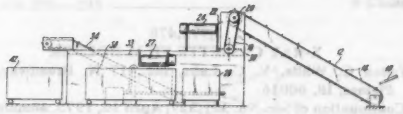
METHOD AND APPARATUS FOR SORTING AND CLASSIFYING METALLIC CANS

John B. Clement, Marblehead, Mass., assignor to Recor, Inc., Cambridge, Mass.

Filed Mar. 5, 1975, Ser. No. 555,705

Int. Cl.² B07C *1/00*

U.S. Cl. 209—73 4 Claims



1. A process for sorting used bimetal, aluminum and ferrous cans comprising:

providing a supply of unsorted used metallic cans;

magnetically separating the ferrous and bimetallic cans from the aluminum cans in said supply;

carrying said separated aluminum cans to a first collecting means;

carrying said ferrous and bimetallic cans to a liquid bath;

immersing said separated ferrous and bimetallic cans in said bath;

collecting said ferrous cans which sink from the bottom of said bath and carrying them into a second collecting means; and

collecting said bimetallic cans and ferrous cans which float at or near the top of said bath from said bath and carrying said bimetallic and ferrous cans which floated to the third collecting means.

3,971,475

TRAY FOR A DOCUMENT HANDLING SYSTEM

Ronald R. Hodges, Grandville, Mich., assignor to Steelcase, Inc., Grand Rapids, Mich.

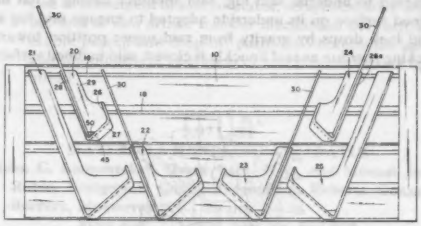
Filed Apr. 16, 1975, Ser. No. 568,673

Int. Cl.² B65D *21/04*; A47F *5/08*

U.S. Cl. 211—88 12 Claims

1. In combination with a tray for a manual paper handling system having an upright support panel means with means for

removably hanging said tray thereon, the improvement comprising said tray having a bottom wall, a side wall and a back wall and hanging means for removably mounting said tray on said panel means with said back wall located immediately adjacent said panel means, said side wall extending substantially perpendicularly away from said panel means and inclined from the vertical, and said bottom wall extending away



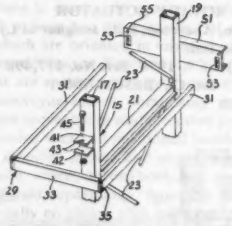
from said panel; said bottom and side walls providing a support for papers with the bottom edge of the papers resting on the bottom wall and the side wall providing a support for laying papers thereagainst; a rigid insert sheet member having an outline of greater dimension than said side wall; and means for removably securing said insert sheet member in place against said side wall for increasing the surface area against which papers lay when inserted into said tray.

3,971,476

RAIL-CARRYING STORAGE RACKS

Anthony N. Konstant, Mount Prospect, Ill., assignor to Speedrack Inc., Skokie, Ill.

Filed Nov. 20, 1974, Ser. No. 525,392
Int. Cl.² A47F 5/00
U.S. Cl. 211—134 **9 Claims**



1. A storage rack for holding superposed loads of palletized goods which comprises

a plurality of upright trusses each of which contains parallel vertical columns which are interconnected by spacers rigidly affixed thereto,

said trusses being arranged in parallel fore-and-aft extending planes and being laterally spaced apart from one another to define a plurality of storage bays therebetween,

plurality of U-shaped load support members carried by each of said trusses at vertical intervals thereupon,

each of said load supports constituting a pair of substantially parallel rails interconnected by an integral leg,

each said U-shaped load support being a tube of rectangular cross section which is formed with a substantially right-angle crush-bend at each corner between said leg and each rail,

first means connecting the central portion of each said leg to one of said columns and

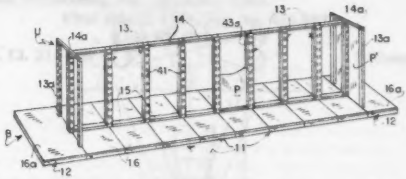
second means connecting the ends of said rails opposite from said leg to another said column in said fore-and-aft extending plane whereby rails on trusses in adjacent fore-and-aft extending planes extend into the storage bay defined thereby and provide support for palletized loads in superposed relation to one another.

3,971,477

FRAMING AND MODULAR BASE UNIT STRUCTURE FOR DISPLAY FIXTURES

Roland L. Bruderly, Alliance, and Edward A. Tomayko, Uniontown, both of Ohio, assignors to Roland L. Bruderly, Alliance, Ohio

Filed Mar. 10, 1975, Ser. No. 556,660
Int. Cl.² A47F 5/16
U.S. Cl. 211—189 **13 Claims**



1. For a floor-supported fixture, such as a gondola fixture or a free-standing wall fixture, including as a skeleton structure a plurality of rectangular base units successively abutted in a linear array on a floor to form an extended base structure, and a plurality of horizontally spaced upright posts received by respective sockets in the base structure and secured in a coplanar array as upright framing in superstructure of the fixture, the improved skeleton structure comprising:

a base unit module structure provided by an open frame of sheet metal generally rectangular in plan outline, and having

at least one pair of opposed sides, each with a straight vertical side panel, affording respective end faces of the module, whereby like modules may be abutted end-to-end with face-to-face contact,

on an inward face of each said side panel a respective upwardly open half-socket formation vertically extended over the height of the respective side, whereby a pair of like modules, placed in aligned abutting relation, form a composite socket symmetrical about the abutment plane,

a plurality of modules disposed in said relation; and, received in each composite socket, an upright post having a bottom end vertically slotted and in exterior cross section generally complementary to the interior shape of a said composite socket

with the end slot of the post accepting abutting side panel portions occurring within the sid composite socket thereby to secure abutting modules together in a base structure.

3,971,478

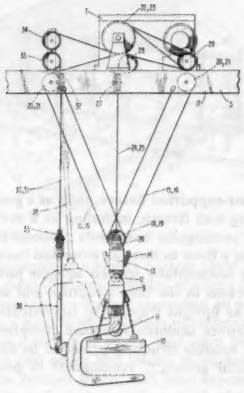
OVERHEAD CRANE WITH LIFTING BEAM PROVIDED WITH C-SHAPED CLAWS

Vasile Matasa, Bucharest, Romania, assignor to Institutul de Proiectare Tehnologica Pentru Laminoare —IPROLAM—, Bucharest, Romania

Filed Oct. 10, 1974, Ser. No. 513,491
Int. Cl.² B66C 17/06, 19/00
U.S. Cl. 212—11 **5 Claims**

1. In an overhead crane with a lifting beam provided with C-shaped claws, said crane having a load trolley on top of which there is a small load crab provided with a load hoisting unit and being rotatable about a vertical axis, the load hoisting unit having a tilting unit, the improvement which comprises:

means for lifting and loading the lifting beam, such means comprising a plurality of pairs of wire ropes having runs inclined with respect to each other, the starting ends of such ropes being secured to the load crab, and a balance system comprising first pulleys mounted on the lifting beam and additional second guiding pulleys being mounted on said load crab, and winding drums mounted on said load crab, the wire ropes being driven by said winding drums, the ropes after being entrained over said first pulleys of the balance system and being guided about said second guiding pulleys being wound upon the driven drums, and means selectively to correlate the tilting and rising movements of the lifting beam, said last-named means comprising a further pair of wire ropes having runs inclined with respect to each other, such further pair of wire ropes having their starting ends attached to the winding drums and guided by being entrained over pairs



of third guiding pulleys mounted on said load crab, the opposite ends of the further wire ropes being entrained over fourth pulleys, the center of rotation of said fourth pulleys being located on one side of and at a distance from the longitudinal center line of the lifting beam, the fourth pulleys being located as near as possible to the horizontal plane passing through the centers of rotation of the first pulleys of the balance system on the lifting beam, a tilting mechanism having a driven rope winding drum, the further ropes after leaving the fourth pulleys being wound round the driven ropes winding drum of the tilting mechanism said fourth pulleys being used for both lifting and tilting and being pivotally connected by an attachment member to the C-shaped claws, the point of attachment of said attachment member of the C-shaped claws being located spaced from the longitudinal center line of the lifting beam on one side thereof.

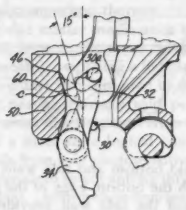
3,971,479

RAILWAY CAR COUPLER

Kenneth L. DePenti, Mayfield Heights, Ohio, assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Jan. 27, 1975, Ser. No. 544,224
Int. Cl.² B61G *3/06*
U.S. Cl. 213—127 **3 Claims**

1. A car coupler having a head, a knuckle pivoted to said head and swingable from closed to open position, said head having a lock receiving chamber provided with a front wall, a lock in said chamber, said lock having a lower position in which the lock is in locking relation with the knuckle when the latter is closed, said lock being movable to an upper position in which the lock is out of locking relation with said knuckle, said lock having a depending leg, a lock lifter toggle operatively connected to said leg, a rotor lever pivoted to said head and pivotally connected to said toggle, said lever being operative to effect lifting of said lock out of locking position with said knuckle to permit opening of the knuckle, anti-creep means on said toggle and wall to prevent undesired upward movement of said lock from its locking position, said means comprising a rearwardly extending lug on said wall and a forwardly extending shoulder on the upper end of said toggle adapted to underlie said lug, said shoulder having a flat inclined surface on its underside adapted to engage said lug as said lock drops by gravity from said upper position toward locking position as said knuckle is closed, said inclined surface



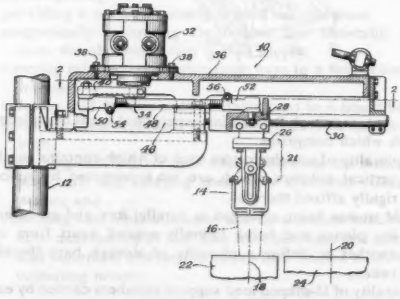
upon engagement with said lug being adapted to cam said leg rearwardly so as to provide a clearance between said wall and the forward side of said leg during dropping of said lock, said inclined surface commencing adjacent the forward edge of said shoulder and extending downwardly and inwardly to about the midpoint of the length of the link, said surface being disposed at an angle of about 15° to the vertical when said surface engages said lug so as to effect positive downward sliding of said inclined surface against said lug so that said shoulder becomes completely disengaged from said lug to allow free dropping of said lock to its knuckle locking position.

3,971,480

ROTARY ACTUATOR

Joseph R. Hamilton, Anderson, Ind., assignor to Lynch Corporation, Anderson, Ind.

Filed June 7, 1974, Ser. No. 477,498
Int. Cl.² B65G *47/00*
U.S. Cl. 214—1 BB **5 Claims**



1. In an article transfer mechanism slidably mounted for rapid intermittent, reciprocating movement between an article pickup position and an article drop-off position, an improved means for moving said article transfer mechanism, comprising, in combination:

a rotatable, reciprocal drive member including a drive shaft,

air driven rotary actuator means for rotating said rotatable, reciprocal drive member,

a drive line pivotally connected to said article transfer mechanism and pivotally connected to said drive member at a point radially outward from the axis of rotation of the drive shaft whereby rotational motion of said drive shaft causes said article transfer mechanism to be linearly reciprocated between said positions for article pickup and drop-off, and

means for controlling the speed, acceleration and deceleration of movement of said rotatable, reciprocal drive member and of said article transfer mechanism between said article pickup and drop-off positions whereby the speed and smoothness of operation of said mechanism are optimized.

3,971,481

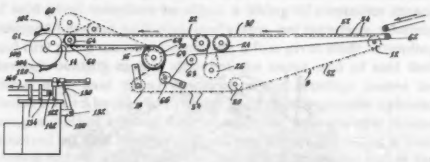
MATERIALS HANDLING APPARATUS

John G. Longenecker, Ozone Park, N.Y., and Manuel Jesus Rubio, Bridgeport, Conn., assignors to Roberto Gonzalez Barrera, Monterrey N.L., Mexico

Filed Apr. 21, 1975, Ser. No. 569,800

Int. Cl.² B65G *57/03*, *47/26*

U.S. Cl. 214—6 H **37 Claims**



1. Apparatus for positionally collating flat objects comprising

a multiplicity of spacer means which are spaced apart from each other, and are affixed to and project upward from spacer member means adapted for causing said spacer means to move in a desired direction,

path means for moveably supporting said spacer member means and for cooperatively acting with said spacer member means to cause said spacer member means to move through at least two substantially flat, adjacent path portions which are oriented in tandem with respect to each other in said desired direction, each tandem pair of which portions are spaced apart by a separation,

outside conveyor means comprising endless continuums which are moveable in said direction and are substantially co-extensive with and positioned beside each side of said spacer member means and across each of said separations, and which, throughout said portions and across each of said separations, have top surfaces which are substantially co-planar with each other, and, throughout said portions, are in a plane which is substantially parallel to said path of movement of said spacer member means but is below the tops of said spacer means,

and means for causing said spacer member means and said outside conveyor means to move in said direction, with said outside conveyor means moving faster than said spacer member means,

said spacer member means and said path means being so cooperatively arranged as to cause spacer members traveling in said direction that have traversed one of said portions and have come to the end thereof closest to a separation to diverge downward from the associated plane described by the tops of said outside conveyor means to such an extent that a point of divergence is reached where the tops of the spacer means move below said plane,

said spacer member means and said path means being so cooperatively arranged as to cause said spacer means to converge upward at the end of said adjacent portion closest to a separation to such an extent that a point of convergence is reached where the tops of said converging spacer means move above the associated plane described by said outside conveyor means,

said path means being adapted to achieve synchronization of the passing of spacers through said point of convergence with respect to the movement of said outside conveyor means, and thereby to effect desired separation between spacer means passing through said point of convergence and each place on the top surface of said outside conveyor means determined by a location thereon which is adjacent to spacer means passing said point of divergence, as said place is the next among such places to approach said point of convergences as said outside conveyor means moves in said direction.

3,971,482

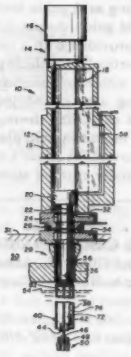
ANTI-LEAK CLOSURE VALVE

Christo Andrea, Windsor Locks, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Jan. 2, 1974, Ser. No. 429,605

Int. Cl. C21c *19/10*

U.S. Cl. 214—27 **7 Claims**



1. In combination with a liquid metal cooled reactor fuel assembly handling machine of the type wherein a handling tube is provided for handling said reactor fuel assemblies, the improvement which comprises:

a. an open ended handling tube;

b. an inwardly facing raised collar at the open end of said handling tube;

c. a valve cap adapted to seal with said collar; and

d. means within said handling tube and connected to said valve cap for closing said valve cap and for raising and swinging said valve cap away from said opening thereby allowing said fuel assembly to be inserted into and removed from said handling tube.

3,971,483

MOTOR TRUCK

Walter Weber, Sanatoriumstrasse 25, Vienna 14, Austria

Filed June 11, 1973, Ser. No. 368,706

Claims priority, application Austria, June 23, 1972, 5447/72

Int. Cl.² B60P *1/00*

U.S. Cl. 214—75 G **1 Claim**

1. A motor truck comprising:

a self-propelled motor-truck chassis having a cab at one end thereof;

means on said chassis defining a cargo space of rectangular plan configuration rearwardly of said cab and accessible

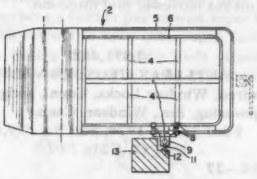
on three sides including the lateral sides and the rear of said cargo space;

guide means including upper and lower rails each extending continuously around and adjacent the respective upper and lower edges of said three sides of said cargo space;

a vertically extending support mounted on said guide means and having upper and lower rollers shiftable along said guide means on said three sides of said cargo space;

a load-carrying platform mounted on said support;

means for vertically displacing said platform relative to said support;



a motor on said support and a drive wheel driven by said motor and engaging said guide means for displacing said support along said guide means,

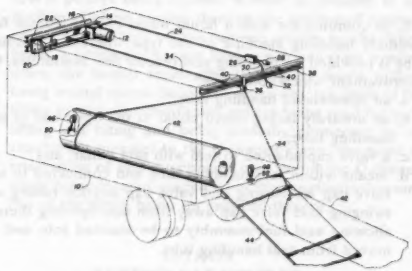
said support being provided with a vertically extending slot, said means for vertically displacing said platform including lifting means within said support, a substantially horizontally extending arm connected at one end to said lifting means and extending through said slot, and hinge means swingably mounting said platform to the other end of said arm for movement about a substantially horizontal axis to a substantially vertical storage position.

3,971,484

TRUCK MOUNTED CARPET HANDLING EQUIPMENT

Lloyd E. Anderson, and Gilbert L. Allnder, both of Minneapolis, Minn., assignors to National Carpet Jobbers, Minneapolis, Minn.

Filed Apr. 14, 1975, Ser. No. 567,712
Int. Cl.² B60P *1/00*
U.S. Cl. 214—85.5 **5 Claims**



1. In combination with a truck having a compartment suitable for transporting carpet rolls, a carpet roll loading and unloading device, comprising:

a shaft rotatably mounted on the upper portion of the front wall of the carpet carrying compartment of said truck, reversible motor means for rotating said shaft to wind said cable about said shaft when said motor means is driven;

motor control means for selectively driving said motor means;

pulley means attached above the rear opening to said carpet carrying compartment;

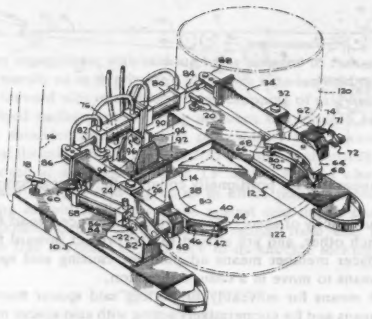
cable means passing over said pulley means, one end of said cable means connected to said shaft, the other end of said cable means terminated in a slip noose to provide means for encircling and engaging said carpet roll, the intermediate portion of said cable means in a first operation condition passing through said first pulley means to provide a substantially vertical lifting force when said motor means rotates said shaft to wind said cable on said shaft thereby to lift the end of a carpet roll engaged by said slip noose to a height above the floor of said carpet carrying compartment sufficient to permit insertion of the end of said carpet roll into said carpet carrying compartment, the central portion of said cable means in a second operating condition passing directly from said shaft without passing through said pulley means to provide a force on the carpet roll engaged by said slip noose which tends to slide said carpet roll toward the front of said carpeting carrying compartment.

3,971,485

FORKLIFT ATTACHMENT

Thomas Hoppey, 142 Carlton Ave., Hazelton, Pa. 18201

Filed Nov. 26, 1974, Ser. No. 527,496
Int. Cl.² B65G *65/34*; B66F *9/18*
U.S. Cl. 214—313 **2 Claims**



1. Attachment means for mounting on a conventional forklift for enabling the lifting and tilting of elongated containers such as barrels, drums or the like, said attachment means comprising base frame means including connection means enabling supported attachment of said base frame means on the forks of a forklift, wherein said base frame means includes first and second fork sleeve members dimensioned and spaced to fit over first and second fork members of a forklift, wherein said connection means includes first and second threaded rods respectively mounted in said first and second fork sleeves and operable for effecting a clamping of said fork sleeves to a fork on which said fork sleeves are respectively mounted, a transverse base frame connection member connected to and extending between the first and second fork sleeve members at a position adjacent the inner end of the fork sleeve members so that said transverse base frame connection member and said fork sleeve members comprise a unitary generally U-shaped frame, first and second spaced container clamp jaw members, first and second container clamp jaw support means mounted on said base frame means for supporting said first and second container clamp jaw members for movement in a horizontal plane toward or away from each other for enabling a clamping of a container between said container clamp jaw members or for releasing said clamp jaw members from a clamped container, said clamp jaw support means including first and second coaxial pivot members on which said first and second container clamp jaw means are respectively mounted for pivotal movement about a horizontal axis coextensive with the axis of said pivot members, a first clamp arm means, means mounting said first clamp arm on said first fork sleeve for pivotal movement about a vertical axis medially of the first

clamp arm and which vertical axis is oriented generally perpendicular to said first fork sleeve, said first pivot member being mounted for pivotal movement adjacent the outer end of said first clamp arm, a second clamp arm, second clamp arm support means supporting said second clamp arm for pivotal movement about a vertical axis medially of said second clamp arm, said second pivot member being mounted adjacent the outer end of said second clamp arm, clamping function power actuator means mounted on said base frame means for actuating said container clamp jaw support means to selectively move said container clamp jaw members toward or away from each other, said clamp function power actuation means comprising a pivot plate mounted for pivotal movement on said base frame and connection member, first and second hydraulic cylinder means coaxially mounted on opposite sides of said pivot plate and respectively having first and second piston rod means connected to the inner ends of said first and second clamp arms for effecting pivotal movement of said first and second clamp arms in opposite directions to provide a clamping or unclamping function with respect to a container or other object positioned between said first and second container clamp jaw members, tilting function power actuator means for pivoting said tilting function power actuator means for pivoting said clamp jaw members about the axis of said pivot members to effect a tilting of container means clamped between said container clamp jaw members, wherein said first pivot member comprises a first pivot shaft extending through bearing means adjacent the outer end of said first clamp arm, said tilting function power actuator means includes a third hydraulic cylinder, said third hydraulic cylinder being mounted on said first clamp arm, an eccentric means mounted on said first pivot shaft, and means providing a connection between said eccentric means and the outer end of the rod of said third hydraulic cylinder whereby actuation of said third hydraulic cylinder pivots said pivot shaft and said first container clamp jaw member and wherein said second pivot member comprises a second pivot shaft mounted in bearing means on the outer end of said second clamp arm and further including biassing means normally maintaining said second pivot shaft in a position in which said second container clamp jaw members is oriented horizontally for permitting rotation of said second clamp jaw upon actuation of said third hydraulic cylinder when a container is clamped between said container clamp jaw members.

3,971,486

APPARATUS FOR HANDLING AND TRANSPORTING CONTAINERS, LOAD SUPPORTING BODIES, PALLETS AND THE LIKE

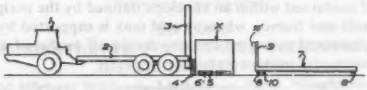
Ingemar Carlsson, Lindesberg, Sweden, assignor to Lihnell Vagn AB, Braas, Sweden

Filed Mar. 13, 1974, Ser. No. 450,918

Claims priority, application Sweden, Mar. 16, 1973, 7303700

Int. Cl.[2] B60P *1/28*

U.S. Cl. 214—505 **5 Claims**



1. An apparatus for handling, loading, unloading and transferring heavy articles comprising a transport vehicle, an elongated frame pivotally mounted on the rear end of said vehicle for movement about a first horizontal axis extending transversely of said vehicle, means moving said frame about a first horizontal axis between a substantially horizontal position and a generally vertical position, a fork lift device, mounting means supporting said fork lift device on said frame for movement theralong, pivot means mounting said fork lift device to said mounting means for pivotal movement about a second horizontal axis extending generally parallel to said first hoizontal axis, means pivotally moving said fork lift device about said second axis, whereby said frame and said fork lift may be pivoted about their respective axes simultaneously, a load supporting body, and cooperating coupling means on said fork lift device and said supporting body whereby, upon engagement of said cooperating coupling means, said body may be loaded onto said vehicle by simultaneous movement of said frame about said first axis and of said fork lift device along said frame and about said second axis, said apparatus also being operable as a conventional fork lift.

3,971,487

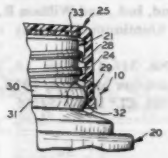
THREADED CAP AND NECK FOR A LIQUID CONTAINER

Gary Van Montgomery, Evansville, Ind., assignor to Sunbeam Plastics Corporation, Evansville, Ind.

Filed July 18, 1975, Ser. No. 596,979

Int. Cl.[2] B65D *55/02, 85/56;* A61J *1/00*

U.S. Cl. 215—216 **10 Claims**



1. In combination, a screw-type cap having a top and a threaded container neck, container neck sealing means on the underside of said cap top, said cap and said neck having mating threads and cooperating opposed surfaces on said cap and said container that are adapted to be engaged when said cap is turned onto said neck into sealing position by the continued engagement of the downwardly effective surfaces of said threads and to continue to exert downward thrust on said cap for retaining said cap in sealing position even when said cap is rotated in a retrograde direction toward open position a sufficient degree to disengage the downwardly effective surfaces of said mating threads and an insufficient degree to disengage said opposed surfaces.

3,971,488

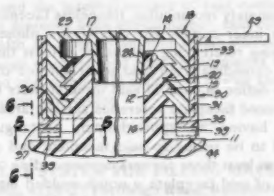
TAMPERPROOF SCREW CAP

John W. McRoskey, Los Angeles; Delbert D. Swartz, Torrance, and Michel A. LeBrun, Jr., Sebastapol, all of Calif., assignors to Republic Tool & Manufacturing Corporation, Los Angeles, Calif.

Filed Aug. 12, 1975, Ser. No. 603,800

Int. Cl.[2] B65D *41/32*

U.S. Cl. 215—254 **5 Claims**



1. A combination spout, cap and locking means for a container comprising:

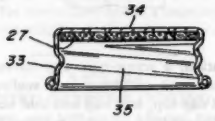
a. an externally threaded spout;
b. an internally threaded cap screwed onto the spout, said spout having a lower annular surface;
c. a removable lock band surrounding the cap, including a shoulder on said lock band extending inwardly below the lower surface of said cap, said shoulder being engageable by said lower surface and lock means for preventing said cap from being removed from said spout as long as said lock band is in place, said lock means including a plurality of teeth projecting downwardly from said shoulder;
d. stationary teeth positioned on said container adjacent said spout engageable with said teeth on said shoulder permitting said lock-band and cap to rotate in a direction to screw said cap onto said spout, but preventing said lock-band and said cap from moving in an opposite direction, thus preventing the unscrewing of said cap;
e. means cooperating between said cap and said lock-band for preventing relative rotation between the two; and
f. means to remove said lock-band from its position on said cap and thereby allowing said cap to be unscrewed from said spout.

3,971,489

CONTAINER CLOSURE

Bing Welch, Richmond, Ind., and William R. Wheeler, Dunlap, Ill., assignors to Aluminum Company of America, Pittsburgh, Pa.

Division of Ser. No. 316,418, Dec. 18, 1972, Pat. No. 3,907,953. This application Mar. 28, 1975, Ser. No. 562,883
Int. Cl.[2] B65D *51/16*
U.S. Cl. 215—261 **2 Claims**



1. A container closure comprising a gas-impermeable shell and a polyvinyl chloride foam liner having a density in a range of 0.67 to 0.72 grams per cubic centimeter in the shell, said liner having an open pore structure, said shell having an end wall and a skirt means depending from the end wall for maintaining said liner in fixed relation to said end wall, said end wall having at least one hole.

3,971,490

COLOR CATHODE RAY TUBE WITH IMPROVED FACEPLATE-FUNNEL REFERENCING STRUCTURES

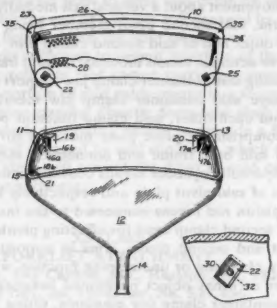
Robert R. Conger, Chicago, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Apr. 22, 1974, Ser. No. 462,915
Int. Cl.[2] H01J *5/02*, *29/07*
U.S. Cl. 220—2.1 A **6 Claims**

1. In a rectangular-type color cathod ray tube of a type having a color selection electrode, the combination comprising:

an approximately rectangular, flangeless faceplate having a concave inner surface for receiving a phosphor screen and having referencing means in at least three corners thereof extending from said inner surface of said faceplate to define in each of said three corners two tangentially spaced faceplate reference surface areas; and

a funnel having an approximately rectangular mouth adapted to be sealed to said faceplate and provided in each of at least three corners corresponding to said three corners of said faceplate a notch molded integrally into said funnel and having an open side addressing the funnel axis, said notch having sides adjoining said open side which define a pair of tangentially spaced inside funnel reference surfaces oriented to capture therebetween the associated faceplate reference surface areas when the faceplate and funnel are assembled, said funnel reference surfaces collectively making interlocking referencing engagement with said associated faceplate reference



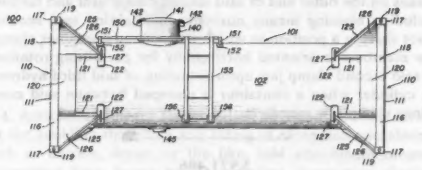
surface areas to uniquely determine the location of said faceplate relative to said funnel and prevent beyond-tolerance rotational and translational relative movement therebetween.

3,971,491

INTERMODAL TANK CONTAINER

Erling Mowatt-Larssen, Warren, Ohio, and Thomas S. Lapikas, Sharon, Pa., assignors to General American Transportation Corporation, Chicago, Ill.

Filed Oct. 14, 1975, Ser. No. 622,253
Int. Cl.[2] B65D *7/42*, *87/00*
U.S. Cl. 220—71 **15 Claims**



1. An intermodal tank container for use interchangeably in railroad, highway, marine and terminal modes, said container comprising a tank for containing ladings and having means for loading lading thereinto and means for unloading lading therefrom, two spaced-apart end frames mounted respectively on the opposite ends of said tank, each end frame including a rigid framework surrounding an area greater than that of the adjacent end of said tank, and a tank support ring surrounding the adjacent end of said tank and secured thereto around the periphery thereof and rigidly secured to said framework for transmitting forces therebetween, said tank comprising the only connection between said end frames and having all parts thereof contained within an envelope defined by the peripheries of said end frames, whereby said tank is supported by said end frames and protected thereby during all modes of use of said intermodal tank container.

3,971,492

HOT MELT APPLICATOR GUN

Glynn H. Lockwood, Carmel Valley, Calif., assignor to Lockwood Technical, Inc., Sand City, Calif.

Filed Sept. 30, 1974, Ser. No. 510,165
Int. Cl.[2] B67D *5/32*, *5/62*
U.S. Cl. 222—146 HE **4 Claims**

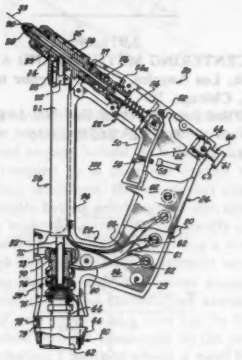
1. In combination with a hand gun for applying to a work piece molten adhesive and the like supplied under pressure

from an adhesive source via a heated flexible hose, said hand gun including a nozzle for directing adhesive forwardly from the gun, normally closed valve means for controlling flow through the nozzle, a handle, and trigger means accessible to a hand grasping the handle for selectively opening the valve means; housing structure for said hand gun comprising

left and right housing members which are substantially mirror images of each other and are releasably joined in mating relation at a common plane of symmetry, said housing members integrally forming a rigid housing including three legs arranged in generally triangular configuration,

said nozzle projecting in alignment from the forward end of one housing leg,

a second housing leg extending downward approximately perpendicularly from the other end of said first housing leg and forming said handle,



the third housing leg integrally interconnecting the forward end of said first leg and the lower end of said second leg, the three legs defining a generally triangular aperture for freely receiving the fingers of a hand grasping the handle,

said housing members further integrally forming a hollow cylindrical cuff section of said housing adjacent the junction of said second and third legs, the cuff section having a cylindrical axis aligned with said third leg,

said hand gun including a heated access tube shielded from said aperture by said third housing leg, the upper tube end communicating with said valve means and nozzle and the lower tube end projecting coaxially into the cuff section,

and swivel means comprising a cylindrical fitting rigidly mounted on the end of said flexible hose and coaxially mounted on the access tube within said cuff section for coaxial rotation in hermetically sealed relation.

3,971,493

COMBINATION TRANSPORTABLE CONTAINER AND DISPENSING RECEIVER

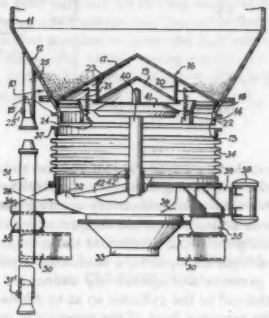
David Michael Williams, 11 Ricardo Road, Minchinhampton, Stroud, Gloucestershire, England

Filed Aug. 26, 1974, Ser. No. 500,505

Int. Cl.[2] B65G *3/12*; B67D *5/06*

U.S. Cl. 222—185 **11 Claims**

1. In combination, a transportable container for particulate materials, comprising a tapering wall portion of hopper form, means defining a discharge opening at its base, a movable valve member adjacent said discharge opening, resilient means urging said valve member downwardly such that the periphery of said valve member is normally held in sealing contact with the inner surface of said tapering wall portion to close said discharge opening, said resilient means comprising a plurality of tension spring means arranged in spaced relationship with each spring means having one end connected to said valve member and the other end anchored on said container, said resilient means and said valve member being wholly disposed within said container above said discharge opening, and said valve member being movable upwardly against the action of said resilient means to define an annular opening between its periphery and the internal surface of said container wall for discharging material from the container; and receiving equipment permanently located at a position where the materials are to be dispensed from the container and which is formed to removably mount said container, said receiving equipment including means operative as the container is lowered onto said equipment to engage the underside of said valve member to effect said upwards opening movement thereof, and said receiving equipment comprising a material receiving member of generally dish-like form and frame means for supporting said receiving member in an elevated position with respect to the ground and said transportable container in position above the receiving member, resilient isolator means disposed between said material receiving member and the frame, and means for vibrating said material receiving member with respect to said frame.



11. A transportable container for particulate materials, comprising a tapering wall portion of hopper form, means defining a discharge opening at its base, a movable valve member adjacent said discharge opening, and resilient means urging said valve member downwardly such that the periphery of said valve member is normally held in sealing contact with the inner surface of said tapering wall portion to close said discharge opening, said resilient means comprising a plurality of tension spring means arranged in spaced relationship with each spring means having one end connected to said valve member and the other end anchored on said container, said resilient means and said valve member being wholly disposed within said container above said discharge opening, and said valve member being movable upwardly against the action of said resilient means to define an annular opening between its periphery and the internal surface of said container wall for discharging material from the container, said container being provided with an internal annular collar spaced inwardly of said discharge opening, and said spring means being distributed around and within said collar and having their other ends anchored upon said collar.

3,971,494

VALVE SYSTEM FOR FILLING MACHINES

Sidney Rosen, 4119-27 Fordleigh Road, Baltimore, Md. 21215

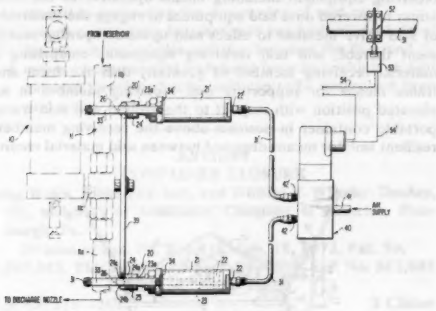
Filed Sept. 2, 1975, Ser. No. 609,541

Int. Cl.[2] B67D *5/18*

U.S. Cl. 222—450 **27 Claims**

1. A valve system for a high-speed filling machine having a pump means which includes a shaft and a filling unit in opera-

tive connection with the shaft and in communication with hose means adapted to connect a reservoir containing the product to be filled with a discharge nozzle structure, said filling unit being operable to suck-in the product during the suction stroke of its pump means by way of a first hose section of said hose means and to discharge the product under pressure during the discharge stroke through the nozzle structure by way of a second hose section, characterized by a valve means operable as at least one of intake and discharge valve and operatively associated with the corresponding hose section to interrupt the flow of the product therethrough, a pneumatically operated piston-cylinder actuating unit for said



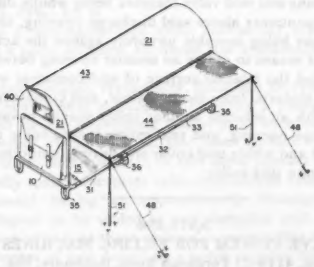
valve means including a cylinder and a piston slidably received in said cylinder and having a piston rod operatively connected with the valve means for selectively opening and closing the valve means as a function of the reciprocating movements of the piston and piston rod, a solenoid valve means adapted to be connected with its input to a source of a pneumatic medium under pressure and operatively connected with at least one output thereof to the cylinder so as to displace the piston thereof by the selective feed of the pneumatic medium under pressure to the cylinder, an energizing circuit for said solenoid valve means including switch means, and means for closing said switch means in dependence on the angular position of said shaft.

3,971,495

COMBINATION PACK FRAME AND BED

Pedro A. Velazquez, 231-48 Mentone Ave., Laurelton, N.Y. 11413

Filed July 1, 1974, Ser. No. 484,979
Int. Cl.² A45F *4/00*
U.S. Cl. 224—10 **4 Claims**



1. A combination sleeper's cot and tent that may be folded up into a pack frame comprising

a tubular frame section formed of telescopic members that may be extended to form the frame of a cot, and

fabric fastened to the frame section which in the extended position of the frame serves as a cot,

with the fabric forming the sides of a back pack when the telescopic members are nested together, in which the tubular frame section is formed of

a first end member in the form of a U-shaped section, formed of two parallel leg sections joined to a common mid-section, two tubular rods, each of which is telescopically engaged inside a leg section of the said first end member, and

a second end section similar in shape to the said first U-shaped section, with each leg section of said second section telescopically engaged inside one of said tubular rods, with

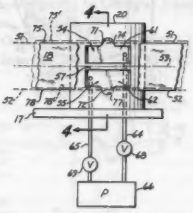
each end section shaped, adjacent the juncture of the mid-section to the leg section, to form a U-shaped support section, the plane of which extends generally perpendicular to the plane of the end section, said support sections serving as legs of the cot formed by telescopically extending the end sections apart from each other.

3,971,496

TAPE CENTERING METHODS AND APPARATUS

Irving Karsh, Los Angeles, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Jan. 14, 1975, Ser. No. 541,036
Int. Cl.² B65H *25/26*
U.S. Cl. 226—3 **8 Claims**



1. A method of centering a tape having two edge regions onto a desired tape advance path, comprising in combination the steps of:

providing a pair of separate cavities at said tape advance path;

providing each of said cavities with a lateral fluid flow orifice extending beyond the desired tape advance path;

providing each of said cavities with a fluid bearing chamber having a larger effective cross-section than said lateral fluid flow orifice;

covering both of said fluid bearing chambers with said tape;

establishing independent fluid pressures in said cavities;

moving said tape along said desired tape advance path;

maintaining both of said fluid bearing chambers covered by said tape during movement of said tape;

subjecting said tape to a first fluid pressure with one of said fluid flow orifices at one of said edge regions;

subjecting said tape to a second fluid pressure with the other of said fluid flow orifices at the other of said edge regions;

increasing said first fluid pressure in response to movement of said one edge region away from said desired tape advance path in one direction by varying the effective cross-section of said one orifice with said one edge region;

returning said tape onto said desired tape advance path with said increased first fluid pressure;

increasing said second fluid pressure in response to movement of said other edge region away from said desired tape advance path in a direction opposite to said one direction by varying the effective cross-section of said orifice with said other edge region; and

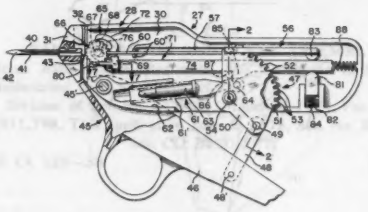
returning said tape onto said desired tape advance path with said increased second fluid pressure.

3,971,497

TAG ATTACHING APPARATUS

Paul H. Hamisch, Sr., Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Apr. 24, 1975, Ser. No. 571,342
Int. Cl.² B25C 1/00
U.S. Cl. 227—67 12 Claims



1. Apparatus for attaching tags using fasteners, the fasteners being arranged in an assembly, each fastener including a bar section and a head section joined by a filament section, the fasteners being coupled to a common carrier member by respective coupling members, the apparatus comprising: a body, a hollow needle having an elongated slot along one side supported by the body and extending outwardly of the body, a push rod supported by the body for driving a bar section of a fastener through the needle with a filament section of the fastener extending through the slot, means engageable with the coupling members to feed the fastener assembly so that one bar section of one fastener at a time can be brought into position to be pushed through the needle by the push rod, the feeding means including a toothed wheel, a pawl for engaging successive teeth of the wheel to advance the wheel, the pawl being movable between first and second positions, and means for actuating the push rod and the pawl in sequence, the actuating means including a spring for urging the pawl to the first position, a manually engageable actuator, a gear segment, a gear section driven by the gear segment for driving the push rod, an abutment carried by the pawl, a projection carried by the gear segment for driving the pawl from the first position to the second position to cause the feed wheel to feed the fastener assembly, and return spring means for returning the actuator, the push rod, the pawl, the gear segment and the gear section to their initial positions.

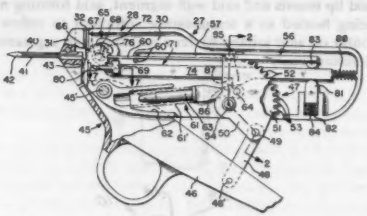
3,971,498

TAG ATTACHING APPARATUS

Charles B. Bussard, Kettering, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Apr. 24, 1975, Ser. No. 571,345
Int. Cl.² B25C 1/00
U.S. Cl. 227—67 31 Claims

1. Apparatus for attaching tags using fasteners, the fasteners being arranged in an assembly, each fastener including a bar section and a head section joined by a filament section, the fasteners being coupled to a common carrier member by respective coupling members, the apparatus comprising: a body, a hollow needle having an elongated slot along one side supported by the body and extending outwardly of the body, a push rod supported by the body for driving a bar section of a fastener through the needle with a filament section of the fastener extending through the slot, means engageable with the coupling members for feeding the fastener assembly so that one bar section of one fastener at a time can be brought into position to be pushed through the needle by the push rod, the feeding means including a toothed wheel, a pawl for engaging successive teeth of the wheel to advance the wheel, the pawl being movable between first and second positions, and means for actuating the push rod and the pawl in sequence, the actuating means including manually engagable actuator, a gear segment driven by the actuator, a gear section driven by the gear segment for driving the push rod, an abutment carried



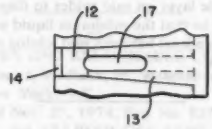
by the pawl and a pair of radially spaced apart projections carried by the gear segment for driving the pawl from the first position to the second position and thereafter from the second position to the first position to cause the feed wheel to feed the fastener assembly, and return spring means for driving the actuator, the push rod, the gear segment and the gear section to their initial positions.

3,971,499

BONDING TOOL

George E. Goodrich, Jr., San Carlos; Earl S. Cain, Portola Valley; George E. Goodrich, Sr., San Carlos; Denis Keith Gilding, Mountain View, and Jerome A. Carlson, Woodside, all of Calif., assignors to Tribotech, Redwood City, Calif.

Filed Sept. 3, 1974, Ser. No. 502,560
Int. Cl.² B23K 31/02
U.S. Cl. 228—54 13 Claims



1. In a bonding tool having a shank and a tapered work end including a narrow bonding tip for holding a wire against a surface to which it is to be bonded, the improvement comprising: a rectangular wire guide opening, which in transverse section is of relatively narrow width and large height, extending through the work end from the rear of the tool to a position adjacent to the bonding tip, whereby bonding wire can be fed and guided from the rear of the tool to the bonding tip over a variety of different angles.

3,971,500

METHOD OF METALLURGICALLY JOINING TUBING TO A WALL SEGMENT

Gerald J. Kushner, and John H. Nininger, III, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed July 16, 1975, Ser. No. 596,317
Int. Cl.² B23K 1/04, 1/12
U.S. Cl. 228—154 9 Claims

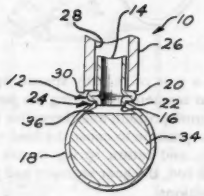
1. The method of joining the end portion of a tube to a wall segment having an aperture for receiving said end portion comprising:

forming a circumferentially disposed radially projecting lip means on said end portion including a joining surface;

coating said joining surface and said wall segment adjacent the aperture;

placing said end portion so that said tube is in communication with said aperture and the joining surface is in contact with said wall segment adjacent said aperture;

placing a forming means on said tube into engagement with said lip means and said wall segment, said forming means being heated to a temperature sufficient to reflow said solder on said joining surface and said wall segment; and simultaneously



applying pressure with said heated forming means to said lip means and said wall segment while the solder is in liquid form, with the thickness of solder between said joining surface and wall segment being reduced to a minimum thickness, and continuing to apply sufficient pressure to deform said lip means and said wall segment and cause relative movement between them and said solder to induce an oxide layer on said solder to disperse in a desultory manner so that the minimum liquid solder film combines to form a joint between said joining surface and said wall segment.

3,971,501

METHOD OF BRAZING ALUMINUM

William Ernest Cooke, Kingston, Canada, assignor to Alcan Research and Development Limited, Montreal, Canada

Filed Apr. 9, 1975, Ser. No. 566,299

Int. Cl.² B23K *35/12*

U.S. Cl. 228—248 **9 Claims**

1. A method of joining aluminum surfaces with an aluminum brazing alloy having a melting point lower than that of metal of the surfaces to be joined, comprising

a. applying in an aqueous vehicle, to at least one of the surfaces, a mixture of said aluminum brazing alloy in powdered form and a powdered flux consisting essentially of a mixture of potassium fluoaluminate complexes essentially free of unreacted potassium fluoride, said mixture being carried as a solid suspension in said aqueous vehicle, to constitute said mixture as a coating on said one surface;

b. drying said coating to evaporate water therefrom;

c. heating said surfaces and said coating, in juxtaposed relation, to a temperature above the brazing alloy melting point for joining the surfaces to produce a brazed assembly; and

d. cooling the brazed assembly to form a solidified joint between the surfaces.

3,971,502

BOX-SHAPED PRODUCT

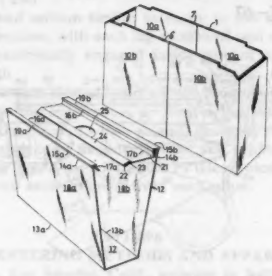
Carl-Erik Grundell, 8 Osmogatan, 122 48 Enskede, Sweden

Filed Sept. 25, 1974, Ser. No. 509,038

Claims priority, application Sweden, Sept. 27, 1973, 7313202; Mar. 20, 1974, 7403746

Int. Cl.² B65D *5/62*

U.S. Cl. 229—14 R **7 Claims**



1. A box, comprising an inner box-shaped member made from a relatively rigid but foldable material and having a bottom, two opposite sides and at least one open side, and a cover member made from a relatively thin but foldable material which extends over at least said bottom and said two opposite sides of said box-shaped member, characterized in that said cover has portions, each folded over one of said opposite sides of said box shaped member, and slotted members each surrounding one of said folded portions and securing said folded portions to said box-shaped member sides at least against displacement in a direction perpendicular to said box-shaped member sides.

3,971,503

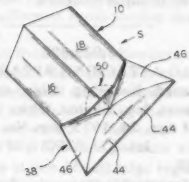
SANITARY PAPERBOARD SCOOP AND CONTAINER

Roger J. Allan, Conshohocken, and Joseph J. Hart, Philadelphia, both of Pa., assignors to Container Corporation of America, Chicago, Ill.

Filed Jan. 27, 1975, Ser. No. 544,325

Int. Cl.² B65D *5/08*

U.S. Cl. 229—38 **1 Claim**



1. A collapsible combination sanitary scoop and container device formed from a unitary blank of foldable paperboard, comprising, in combination:

a. a plurality of side walls hingedly interconnected to form a generally tubular body member open at one end;

b. an integral cover member hingedly connected to an upper edge of said body member and being operable to serve both as a scoop for introducing material into said body member and as a cover for closing the open end of said body member;

c. said cover member comprising:

i. a cover element including a pair of cover panels spaced from each other;

ii. a gusset element interposed between said cover panels and including a pair of foldably interconnected gusset panels;

iii. said cover and gusset elements being foldably joined to each other and to said body member to provide in cooperation with each other a scoop having rear and side portions of a combined width in excess of the width of any one of said body side walls;

d. said body member including means engageable with a portion of said cover member for locking said cover member in a closed position.

3,971,504

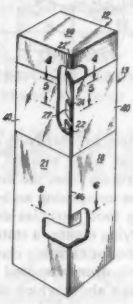
BANDED CARTON AND BLANK ASSEMBLY

Adrian Alan Whyte, Bardonia, N.Y., assignor to Schenley Industries, Inc., New York, N.Y.

Division of Ser. No. 447,434, March 1, 1974, Pat. No. 3,911,798. This application June 6, 1975, Ser. No. 584,311

Int. Cl.² B65D 5/10

U.S. Cl. 229—38 **1 Claim**



1. A carton erected from a carton blank comprising a generally rectangular sheet having score and cut lines therein defining a plurality of adjacent body panels having end forming flaps at opposite ends thereof, a glue flap along one of said body panels, a tab defined in said glue flap, a pair of tabs along another of said body panels, a slot in said another body panel determined by said pair of tabs, said slot being axially aligned with said tab provided in said glue flap along one of said body panels, and an identification band extending transversely across said body panels in overlying relation to said outer surface, said identification band having opposed ends and in margins located a predetermined distance from said respective opposed ends, respective series of longitudinal perforations, one of said opposed ends of said identification band being adhesively secured to said pair of tabs provided along said another body panel along said margin of said identification band, said other opposed end of said identification band being adhesively secured to said tab provided in said glue flap along one of said body panels along said margin of said identification band, said identification band being otherwise free from said body panels of said carton blank, said carton being erected from said carton blank and having a body seam at one corner thereof, said body seam including said tab provided in said glue flap along one of said body panels and said perforated margin of said identification band secured thereto, and an adhesive securing an outer face of said perforated band margin to said perforated outer face of said band margin secured to said pair of tabs along said another body panel, said tab provided in said glue flap said adhesively bonded tabs and band margins being disposed within said carton.

3,971,505

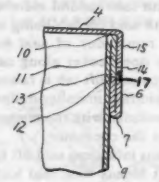
CONTAINER

Hachiro Ohkubo, 3-23, Higashi, Nozato-cho, Nishiyodogawa, Osaka, Japan

Continuation-in-part of Ser. No. 328,228, Jan. 31, 1973, abandoned. This application Nov. 8, 1974, Ser. No. 522,207

Int. Cl.² B65D 5/66, 45/00, 5/22

U.S. Cl. 229—45 R **1 Claim**



1. A hexahedral container comprising a bottom wall and four tightly closed-up side walls, constituting a body of the container, one of said walls being a front wall; a lid capable of being freely opened and closed said lid, said lid being integrally but pivotally connected at its rear to the top of said body; a hanging wall at the front of said lid; a stopping member attached to the hanging wall indicated on the inner surface of said hanging wall; a stopping device at the top of said front wall, said stopping device being elastic in the outward direction; said stopping member and said stopping device having free end abutment portions engaging each other to prevent further movement when said lid is closed; and a finger pressing piece on said hanging wall, said pressing piece is defined by at least one cut line in said hanging wall and a frangible linking portion thereat linking said pressing piece to said hanging wall, between said cut line, said hanging wall and said pressing piece, respectively, covering said abutment portions of said stopping member and said stopping device when said lid is closed, said frangible linking portion comprising means for sealing said container and for preventing opening thereof unless said frangible linking portion is broken as well as for providing indicia that the container has never been opened.

3,971,506

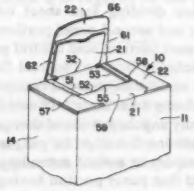
TEAR OPEN AND RELOCKABLE CONTAINER

Robert Fred Roenna, Medinah, Ill., assignor to St. Regis Paper Company, New York, N.Y.

Filed Nov. 27, 1974, Ser. No. 527,531

Int. Cl.² B65D 5/54, 45/00

U.S. Cl. 229—51 TC **8 Claims**



1. A tear open and relockable container, comprising in combination:

side means, bottom means, and top means in the container with said means having a first and a second member including a first and second edge, respectively,

said first member having a container aperture perforation defining a container aperture and with said container aperture perforation including a locking projection extending toward said first edge,

said first member having locking slot means extending in line with a side of said container aperture,

said second member having a first and a second perforation with a lift tab fold line extending between said first and second perforations defining a lift tab therebetween,

a lift tab perforation located between said first and second perforations and intersecting said lift tab fold line forming a reopen tab;

adhesive means for securing said second member to said first member with said second member overlapping said first member with said lift tab being in an initial position relative to the remainder of said second member for providing a tear open cover along said first and second perforations when said lift tab is raised thereby removing the portion of said first member defined by the container aperture in accordance with the movement of said second member to open the container;

and relocking means including said lift tab being inserted in said locking slot means with said locking projection extending through said lift tab perforation resulting in a first engagement between said lift tab and the bottom surface of said first member and resulting in a second engagement between said reopen tab and the top surface of said first member whereby said lift tab is biased to return to said initial position relative to the remainder of said second member by action of the content of the container on said lift tab when the container is overturned to increase the force of said first and second engagements.

3,971,507

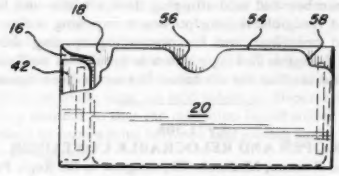
FOLDED MONEY PACK ENVELOPE

Mayne B. Stevenson, Park Ridge, Ill., assignor to Arvey Corporation, Chicago, Ill.

Filed Oct. 20, 1975, Ser. No. 623,901

Int. Cl.² B65D 27/08

U.S. Cl. 229—72 **8 Claims**



1. A sheet adapted to be folded to produce an envelope, said sheet being generally rectangular in plan view and having four lateral edges, said sheet having first and second spaced parallel fold lines dividing said sheet into a central panel portion and first and second panel portions on opposite sides of said central panel portion, said central panel portion having opposite ends defining first and second flat planar edges extending parallel to each other, said first panel portion having one flat edge defining an extension of said first flat planar edge and being inwardly angularly related thereto, between said flat planar edges, said one flat edge defining an included angle of a least 1° with respect to a plane extending along said first flat planar edge, said first panel portion having a second flat edge offset inwardly from said second flat planar edge of said central panel portion and extending generally parallel thereto, said second panel portion having a further fold line defining a continuation of said second flat planar edge to produce a tab, said tab having an outer lateral flat edge spaced from said further fold line by a dimension that is less than the spacing between the second flat edge of said first panel portion and the second flat edge of said central panel portion so that said tab can be folded along said further fold line, said sheet can be folded along said first fold line to place said first panel portion in overlapping relation with said central panel portion and subsequently along said second fold line to have said second panel portion in overlapping relation with said first panel portion while said tab is in overlapping relation with said central panel portion.

3,971,508

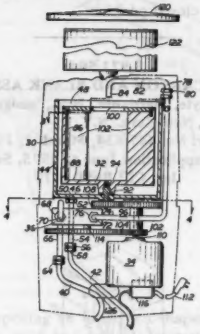
OIL CLARIFICATION SYSTEM

Clayton Giangiulio, 5 Skyline Drive, Malvern, Pa. 19355

Filed Feb. 3, 1975, Ser. No. 546,592

Int. Cl.² B04B 11/04

U.S. Cl. 233—4 **8 Claims**



1. An automatic system for clarifying cooking oil held in a deep fat fryer apparatus while said oil is hot by extracting higher density food particles from the lower density oil, comprising clarifying means comprising an inlet tube for carrying hot cooking oil having food particles disposed therein from said fryer to said clarifying means, a stationary hollow collector having an outlet tube for carrying clarified oil back to said fryer, a hollow rotatable drum disposed within said collector and having a central axis about which the drum rotates, said drum including an imperforate circular side wall disposed about said axis, a bottom wall and a top wall including an opening disposed about said axis and within said collector, pump means for carrying hot oil having food particles disposed therein from said fryer, through said inlet tube, and into said drum, motor means for rotating said drum at a high speed, and temperature responsive means adapted for immersion within the oil in said fryer and connected to said pump means and said motor means for automatically turning said pump means and said motor means on when the temperature of the oil in said fryer reaches a predetermined level and for automatically turning said pump means and said motor means off when the temperature of said oil drops below said level, whereupon the centrifugal force produced by said rotation effects the separation of said food particles by causing said particles to be thrown radially outward from said central axis against said imperforate side wall to be held thereon while said lower density oil flows over said trapped particles, out through the central opening in the top wall of the drum and into said collector for return to said fryer.

3,971,509

CENTRIFUGE COMPRISING AN OUTER DRUM AND AN INNER ROTOR PROVIDED WITH A CONVEYOR SCREW

Frank Birger Johnsen, Virum, Denmark, assignor to Titan Separator A/S, Soborg, Denmark

Filed Sept. 24, 1974, Ser. No. 508,942

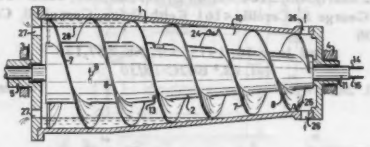
Claims priority, application Germany, Oct. 1, 1973, 2349298

Int. Cl.² B04B 1/20, 15/12

U.S. Cl. 233—7 **5 Claims**

1. In a centrifuge for separating a solid phase from a liquid phase, said centrifuge including a drum, means journalling

said drum for rotation about an axis, a hollow rotor mounted coaxially within said drum and defining therewith a separating space, a conveyor screw secured externally to said rotor and comprising at least two continuous helices defining between them helical ducts, means for supplying a raw material including said liquid and solid phases to each of said helical ducts, outlet means at opposite ends of said separating space for



discharging said liquid and solid phases separately therefrom, the improvement comprising at least one aperture in each of said screw helices intermediate the ends thereof, said apertures extending inwardly from the outer periphery of the respective said screw helices and being located in a common helicoid surface, an opening in said rotor adjacent each of said apertures, and means for supplying a washing liquid through each opening into said separating space.

3,971,510

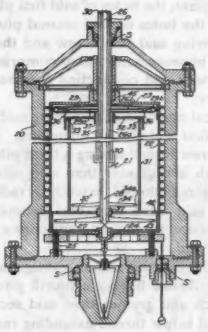
CENTRIFUGAL SEPARATOR

Theodore Frederick Morse, 25 Taber Ave., Providence, R.I. 02906

Continuation-in-part of Ser. No. 126,104, March 19, 1971. This application June 9, 1972, Ser. No. 261,449

Int. Cl.[2] B04B *1/00*

U.S. Cl. 233—27 **3 Claims**



1. An ultracentrifuge having a gas tight cylindrical housing an axis having a hollow axially mounted central shaft with a surrounding stationary annulus and surrounding duct means, a first cylindrical shell having top and bottom walls and mounted about said shaft for rotation about the axis of the housing, means for rotating said shell, a second cylinder mounted within said first shell for rotation therewith, means at the lower end of said first shell for exhausting gas, a stagnation arm mounted adjacent the top wall of the first shell, means for introducing gas into said second cylinder through said annulus, said stagnation arm having a duct therein with a port adjacent the wall of the first shell to carry off waste products, said duct terminating adjacent said annulus in the second cylinder, a second stagnation arm with a duct therein mounted adjacent the bottom wall of the second cylinder to stimulate secondary flow, said duct communicating with the surrounding duct means, a choked duct between said second cylinder and said first cylindrical shell to deliver products of gas from the inner second cylinder cylinder the first cylindrical shell whereby a large pressure differential may be maintained across the second cylinder wall and means at the lower end of said second cylinder for exhausting waste gas.

3,971,511

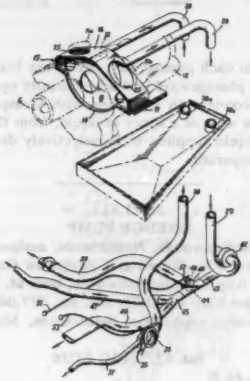
CABIN HEATER FOR HELICOPTERS AND FIXED WING AIRCRAFT

Anthony Joseph Casey, 5029 Perron St., Pierrefonds, Quebec, Canada (H8Z 2J2)

Filed Apr. 16, 1975, Ser. No. 568,420

Int. Cl.[2] B60H *1/06*

U.S. Cl. 237—12.3 A **7 Claims**



1. A cabin air heating system for rotary and fixed wing aircraft in which the aircraft is driven by a gas turbine engine, in combination, a gas turbine engine having an exhaust discharge section, and air heating chamber about the exhaust discharge section of the engine, duct means to circulate fresh air from without the aircraft and recycled cabin air through the air heating chamber and to the cabin of the aircraft, a first valve means located within a valve box having a fresh air inlet, an air inlet from the cabin of the aircraft and an air outlet to said heating chamber to permit fresh air and recycled cabin air to pass through the air heating chamber when the aircraft is in flight or on the ground with the engine running, the first valve means in one position closing off the cabin air inlet to the valve box and permitting a full flow of fresh air to the air heating chamber, and in another position permitting a restricted inflow of fresh air and a full flow of air from the cabin through the valve box to the air heating chamber, and a second valve means to effect discharge of heated air to the atmosphere when the aircraft is in flight or on the ground with the engine running.

3,971,512

SPRAYING APPARATUS

David Robertson Duncan, Roundhill Farm, Charlton Musgrove, Wincanton, Somerset, England

Filed Apr. 21, 1975, Ser. No. 569,958

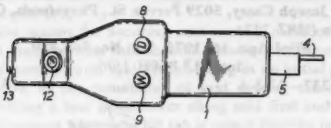
Claims priority, application United Kingdom, Apr. 26, 1974, 19237/73

Int. Cl.[2] B05B *1/14*

U.S. Cl. 239—1 **10 Claims**

1. Spraying apparatus comprising two liquid input lines for independent supply of two liquids, one input line being so disposed that it surrounds the other input line, a valve unit defining two passageways, a first inlet connection interconnecting the one input line with one of the passageways and a second inlet connection interconnecting the other input line with the other passageway, the outer extremities of the first inlet connection being disposed to the outside of the outer extremities of the second inlet connection in the directions

normal to the liquid flow axes of the two inlet connections, separate outlet nozzles from each passageway, one of the nozzles being constructed to create a jet for liquid ejected therefrom and the other nozzle being constructed to create a spray for liquid ejected therefrom, and valves independently



disposed within each passageway, which are biassed to close the respective passageways and are manually operable selectively to interconnect an input line with a respective outlet nozzle to allow a jet or a spray of liquid, from the respective independent liquid supplies, to be selectively dispensed from the spraying apparatus.

3,971,513
DREDGE PUMP

Johan Klip, Berkenwoude, Netherlands, assignor to Konijn Machinebouw B.V., Hoorn and Bagger-en Constructie Bedrijf Johan Klip B.V., Berkenwoude, both of, Netherlands

Filed May 13, 1975, Ser. No. 577,008

Claims priority, application Netherlands, May 22, 1974, 7406866

Int. Cl.² B02C *23/36*

U.S. Cl. 241—46 R **9 Claims**

1. Dredge pump, consisting of a volute pump casing, with a lateral, round suction opening and with an outlet, in which pump casing an impeller is mounted which consists of a front plate with an opening adjoining the suction opening of the pump casing, of a back plate which is connected to a drive shaft supported in the pump casing and coupled to a motor, and of two blades extending between the front plate and the back plate and connecting these to each other, one of which blades, which has at least substantially the form of a circular arc at its end nearest the axis of rotation and subsequently increases in radius, forms a passage which is connected through the opening in the front plate to the suction opening of the pump casing and which is passed in the direction of its lateral outlet by all dredged material which is to be pumped, one end of the second blade adjoining the aforementioned end of the first blade radially on the outside and the other end of this second blade lying at least substantially diametrically opposite the other end of the first blade, the two blades, viewed from the axis of rotation, having a concave curvature, the passages formed by the first blade increasing gradually in width from the central inlet towards the lateral outlet, said central inlet being bounded by the part of the blade having at least substantially the form of a circular arc, the front plate and the back plate having a cutting edge along at least the greater part of their periphery, said cutting edge being located in their outer surface, said front plate and said back plate of the impeller having two curved end edges which are symmetrical with respect to the axial plane passing through the adjoining ends of the two blades, each edge ending on one side at the location of the outer end of one of the blades.

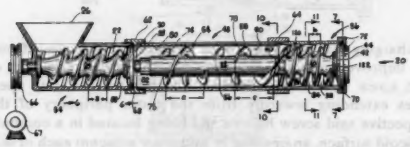
3,971,514
MEAT GRINDER ATTACHMENT

Luigi E. Martinelli, 5164 Rafton Drive, San Jose, Calif. 95124, and George S. Cerelli, 4161 Keith Drive, Campbell, Calif. 95008

Filed June 16, 1975, Ser. No. 587,125

Int. Cl.² B02C *18/30*

U.S. Cl. 241—82.4 **10 Claims**



1. In a grinder comprising a feed hopper for delivering material to be ground to a first cylindrical chamber; a first screw having a first pitch within said first chamber for coarsely grinding and transporting said material from said hopper passed a first rotary knife mounted to said first screw and through a first plurality of generally equal sized holes in a first plate; a second screw having a second pitch drivingly attached coaxially to said first screw within a second cylindrical chamber for finely grinding and transporting said material from said first plate passed a second rotary knife mounted to said second screw and through a second plurality of generally equal sized holes in a second plate; the holes of said first plurality of holes being larger than the holes of said second plurality of holes; and means for driving said first screw and thereby also said second screw; an improvement which comprises:

a shaft coaxial with and connecting together said first and second screws;

a third cylindrical chamber surrounding said shaft and connecting said first and second chambers;

a first partial screw thread having a third pitch greater than said first pitch and greater than said second pitch, said first partial screw thread extending radially from said shaft within said third chamber commencing adjacent said first plate and terminating adjacent a central portion of said shaft; and

a second partial screw thread non-contiguous with said first partial screw thread having a fourth pitch greater than said first pitch and greater than said second pitch, said second partial screw thread extending radially from said shaft within said third chamber commencing adjacent the central portion of said shaft and terminating adjacent said second screw.

3,971,515
BALL MILL WITH ENERGIZING BODY ON THE WEARING PLATE

Helmut Haas, Proz-Wahn, and Manfred Wolf, Lohmar, both of Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Germany

Filed Dec. 12, 1973, Ser. No. 426,635

Claims priority, application Germany, Dec. 13, 1972, 2260830

Int. Cl.² B02C *17/14, 17/22*

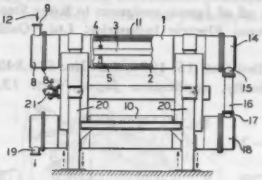
U.S. Cl. 241—175 **4 Claims**

1. A vibratory mill having a chamber for containing movable grinding bodies therein comprising:

a wall forming a grinding chamber;

means for driving the chamber in a vibratory grinding motion;

a fixed body within the chamber spaced from the wall;
a wearing plate within the wall on the inner surface of the chamber shaped to conform to the inner surface of the



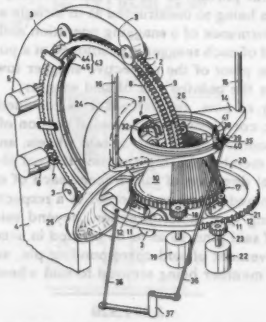
grinding chamber and being resilient and biased outwardly against the inner surface of the wall for holding its position therein;
and means supporting said body on said wearing plate.

3,971,516

DEVICE FOR WINDING TOROIDAL DEFLECTION COILS

Edgard Emile Charles Rossaert, Dilbeek, Belgium, assignor to U.S. Philips Corporation, New York, N.Y.

Filed June 18, 1974, Ser. No. 480,539
Claims priority, application Netherlands, June 22, 1973, 7308700
Int. Cl.[2] H01F *41/08*
U.S. Cl. 242—4 B 6 Claims



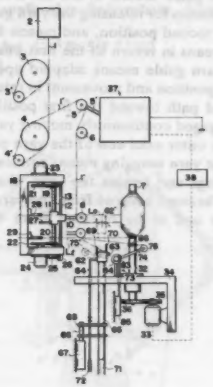
1. In an apparatus for winding toroidal coils comprising a rotatable winding wheel lying in a plane, a part of said wheel being detachable for insertion of a core on which a winding is to be wound, the core having first and second end faces, means for rotating said core about a first axis, and a first wire guide adjacent said first end face, an improved wire guide arrangement allowing the slanted winding of coils, comprising an annular member, means for pivoting said annular member about said first axis, and a second wire guide connected to said annular member for pivotal motion therewith, said second wire guide comprising two wire interceptors mounted on said annular member to fan out laterally from an edge of said second end face a distance such that in each position of the annular member one of the wire interceptors intercepts the plane of the winding wheel.

3,971,517

APPARATUS FOR WINDING A YARN ROUND A BOBBIN

Yosio Matuura; Shoichi Murakami; Norihisa Yamaguchi; Takashi Kishida; Sadao Kadokura, and Kiyoshi Imai, all of Mihara, Japan, assignors to Teijin Limited, Osaka, Japan

Continuation-in-part of Ser. No. 344,512, March 26, 1973, abandoned. This application Aug. 12, 1974, Ser. No. 496,514
Claims priority, application Japan, May 15, 1972, 47-47157; May 15, 1972, 47-47160; May 27, 1972, 47-52150; June 8, 1972, 47-56429; June 8, 1972, 47-66016[U]
Int. Cl.[2] B65H *54/02*, *54/32*
U.S. Cl. 242—18 R 6 Claims



1. An apparatus for winding a yarn round a bobbin without twisting, which comprises:
an uprightly supported bobbin;
means for driving said bobbin to wind the yarn extruded from a spinning apparatus at a speed higher than 2000 m/min.;
a guide roller rotatably mounted to a supporting arm;
means for introducing the yarn to said guide roller substantially in parallel to the axis of said bobbin;
means for slowly traversing said guide roller supporting arm substantially in parallel to the axis of said bobbin; and
means for traversing said guide roller supporting arm with traverse strokes which gradually become shorter as the diameter of the wound yarn becomes larger;
said supporting arm comprising a bearing frame to which said guide roller is rotatably supported;
a frame member to which said bearing frame is swingably pivoted; and
a tension spring disposed between said frame member and bearing frame.

3,971,518

TRANSFER TAIL APPARATUS FOR USE WITH TEXTILE YARN WINDERS

Larry B. Newman, and John W. Demuth, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

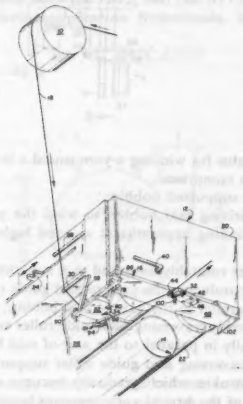
Filed Nov. 18, 1974, Ser. No. 524,902
Int. Cl.[2] B65H *54/02*
U.S. Cl. 242—18 PW 7 Claims

1. A transfer tail apparatus adapted to form a transfer tail on the outer end portion of a rotating yarn package tube, which is mounted on a yarn winder having a yarn traverse guide reciprocating along a path parallelly spaced from the package portion of the yarn package tube, the yarn package tube having at its outer axial end yarn snagging means for snagging and retaining yarn on the yarn package tube, the transfer tail apparatus comprising:

a first yarn guide means mounted spaced outwardly from the outer axial end of the yarn package tube and a second yarn guide means mounted spaced outwardly parallel to the axis of the yarn package tube and adjacent to the outer end portion of the yarn package tube, each yarn guide means adapted to receive, retain and engagingly guide a continuously moving yarn from a source of supply to a waste receiver and adapted as mounted so as to be moved in a predetermined path from a first position to a latched second position, and upon release, to be moved in return along a predetermined path to the first position;

each yarn guide means including a latch means for latching the yarn guide means in the latched second position, a release means for releasing the yarn guide means from the latched second position, and means for moving the yarn guide means in return to the first position;

the first yarn guide means adapted upon release from the latched position and movement in return along the predetermined path toward the first position to translate the thus engaged continuously moving yarn into engagement with the outer axial end of the yarn package tube whereupon the yarn snagging means rotates into snagging position, snags and retains the yarn, thereafter causing the yarn to become severed from the yarn going to the waste receiver and to be released from the first yarn guide means;



the second yarn guide means adapted as mounted in the latched second position to guide the thus engaged continuously moving yarn into a waste bunch of predetermined number of wraps on the outer end portion of the rotating yarn package tube, and upon release from the latched second position and movement in return along the predetermined path toward the first position to guide the yarn into a predetermined number of spaced helical wraps along the yarn package tube between the waste bunch and the package portion of the yarn package tube as the second yarn guide means moves and is also adapted at a predetermined point along its path of movement to move out of engagement with and thus release the yarn from the second yarn guide means for subsequent pickup by the yarn traverse guide for winding of the yarn package on the package portion of the yarn package tube; and

the release means for the second yarn guide means being actuated for release of the second yarn guide means from the latched second position in response to continued movement of the first yarn guide means toward the first position following the snagging and severing of the yarn, wherein the latch means for the first yarn guide means includes means for actuating the release means for the second yarn guide means.

3,971,519

MECHANISM FOR PREVENTING THE ADVERSE EFFECTS OF CENTRIFUGAL FORCE IN A STRAND WINDING MACHINE

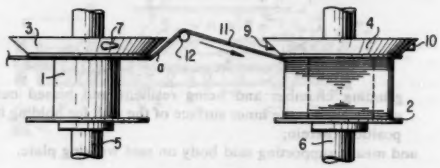
Yoshio Ikegami; Hirohumi Kimura; Tadashi Kohge, all of Kobe; Katsuji Sakamoto, and Takenbu Higashimoto, both of Yokohama, all of Japan, assignors to Kobe Steel Ltd., Kobe and Sumitomo Electric Industries, Ltd., Osaka, both of, Japan

Filed Oct. 15, 1974, Ser. No. 514,848

Claims priority, application Japan, Oct. 13, 1973, 48-118923

Int. Cl.² B65H *67/04*

U.S. Cl. 242—25 A **3 Claims**



1. In a strand winding machine having two wheels and two reels respectively supported thereon, snaggers provided at the outer peripheral portion of each wheel rotatable with said reels and a mechanism for shifting the strand from a full reel to an empty reel, the improvement comprising:

each of said wheels having the outer peripheral portion thereof shaped so as to form a part of a cone;

shafts extending through the outer peripheral portion of each of said wheels so as to be parallel to the central axis of revolution of each of said wheels;

a respective one of said snaggers provided at one end of each of said shafts so as to be pivotable on the outer peripheral portion of its associated wheel, each of said snaggers being so constructed as to include a pointed end for performance of a snagging operation and wherein the centroid of each snagger is positioned at a point displaced from the pivot of the respective snagger toward the side opposite the pointed end of said snagger;

a plurality of pins, each of which is provided at at radial position corresponding to a radial portion of each of said reels mounted upon each of said wheels; and

pivotable members having a portion thereof pivotable along the axial direction of said wheels, each of said members being joined at one end thereof to a respective shaft and extending in a radial direction, beyond said position of each of said pins, so as to be pivoted in accordance with the movement of said corresponding pin, said other end of said member being secured to said wheel.

3,971,520

APPARATUS FOR DOFFING AND INSERTING EMPTY CORES ON AN AUTOMATIC WINDER

Junichiro Shimai, Kyoto, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Aug. 8, 1974, Ser. No. 496,088

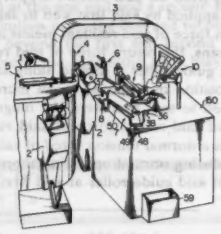
Claims priority, application Japan, Aug. 14, 1973, 48-91394

Int. Cl.² B65H *54/20, 54/24, 67/04*

U.S. Cl. 242—35.5 A **9 Claims**

1. An apparatus for doffing and inserting empty cores on automatic winder having core holders each adapted to clamp and free a core by assuming first and second prescribed positions respectively, and each mounted to urge a core mounted thereon toward a winding drum for forming full packages of yarn on the core from yarn on a bobbin, during a winding operation, said apparatus comprising, in combination, a position holding mechanism for lifting a full package from a winding drum, a forwarding mechanism for turning a core holder from a first position to a second position comprising means positionable to engage and push a side of a full package lifted by said position holding mechanism, a package take-off mech-

anism for taking off said full package comprising means positionable to engage and push one end of a full package on a core holder turned to its second position by said forwarding mechanism, a receiver mechanism positioned to receive a full package taken off a core holder by said take-off mechanism, a yarn severing and holding mechanism positionable to sever a yarn portion extending from a full package in said receiver



mechanism to a bobbin and to hold the end of the severed yarn extending to said bobbin, and a core inserting mechanism comprising means positionable to insert an empty core over a core holder from which a full package has been taken off by said take-off mechanism and means positionable to engage and push a side of said empty core on said core holder for returning said core holder to its first position.

3,971,521

APPARATUS FOR COLLECTING A CORELESS COILED THREAD PACKAGE

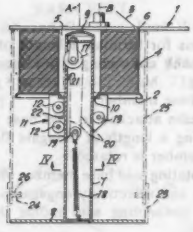
Renato Crotti, 71, Carso Canalgrande, Modena, Italy (4100)

Filed Mar. 11, 1974, Ser. No. 450,160

Claims priority, application Italy, Mar. 15, 1973, 12515/73

Int. Cl.[2] B65H *54/80*

U.S. Cl. 242—47 **3 Claims**



1. An apparatus for collecting a coreless coiled thread package having a central hollow bore, said apparatus comprising:

a thread collecting or receiving disc, having means for defining a central through bore;

a vertical guide column passing through said bore of the said receiving disc, so as to permit vertical displacement of the said receiving disc upwardly and downwardly along said guide column, said guide column being constructed as a tubular hollow column structure,

supporting means for supporting said receiving disc during its vertical displacement along the guide column, said supporting means comprising a carriage mounted on the column to move therealong in the vertical direction, said receiving disc being fitted in a removable but nonrotatable manner onto the said carriage,

and further means being arranged inside of the hollow column structure for elastically urging said supporting means upwardly, towards the top of the column,

and said guide column having a section which is non-circular, presenting at least two substantially straight sides, and the carriage being mounted on rollers, at least two of said rollers being arranged so as to roll along the flat surfaces of the column corresponding to said straight sides.

3,971,522

APPARATUS FOR STORAGE OF FILAMENTARY MATERIAL

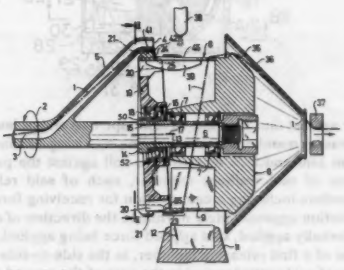
Erwin Pfarrwaller, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Sept. 20, 1974, Ser. No. 507,948

Claims priority, application Switzerland, Sept. 25, 1973, 13702/73

Int. Cl.[2] B65H *51/20*

U.S. Cl. 242—47.01 **7 Claims**



1. Apparatus for the storage of filamentary material comprising a hollow shaft having a free end, a drum having an exterior surface conforming substantially to a surface of revolution, a wheel, means mounting the wheel and drum on the free end of the shaft for rotation with respect to the shaft about separate axes which are skew to each other, a flyer arm affixed to the shaft and extending radially and axially thereof into exterior overlapping relation with said surface of the drum adjacent the end thereof nearest the other end of the shaft, said exterior surface including, adjacent said end of the drum, a plurality of axially extending slots disposed about the periphery thereof, whereby upon rotation of the drum with respect to the shaft a filament passed through the shaft and out onto the arm will be laid in a helical coil on said surface adjacent said end of the drum and may be pulled off of the other end of the drum, and teeth on the wheel engaging the slots, the teeth having each a thread lifting top land surface extending substantially parallel to the axis of the wheel over a minor fraction of the length of the drum including however the portion of the drum length beneath the flyer arm, the teeth further having each a thread-thrusting surface extending in a direction includng a component radial of the wheel, whereby the top lands and thrusting surfaces engage only the portion of the coil nearest said end of the drum.

3,971,523

ENDLESS TAPE CARTRIDGE

Masaaki Ishii, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 242,879, April 7, 1972, abandoned. This application Aug. 6, 1974, Ser. No. 495,211

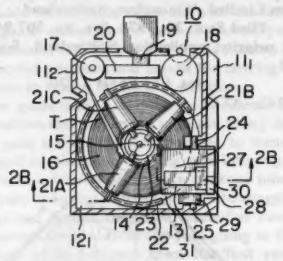
Claims priority, application Japan, Apr. 14, 1971, 46-28622[U]; Apr. 14, 1971, 46-28623[U]; Apr. 14, 1971, 46-28624[U]; Apr. 14, 1971, 46-28625[U]; Apr. 14, 1971, 46-28628[U]

Int. Cl.[2] G11B *23/10*

U.S. Cl. 242—55.19 A **7 Claims**

1. An endless tape cartridge comprising:

a housing;
a tape coil in endless form;
a reel member including a reel hub and a reel flange for rotatably supporting said endless tape coil a a normal operative position, and
a brake member for preventing movement of said tape coil when said cartridge is not in use, said brake member including a wing-like member pivotally journalled in said housing and engageable with one end face of said tape coil, a resilient member for pressing said wing-like member against one end face of said tape coil and at least two releasing members for disengaging said wing-like member from said end face of said tape coil against the pressing force of said resilient member, each of said releasing members including a cam portion for receiving force in a direction approximately normal to the direction of a force externally applied, said applied force being applied, in the case of a first releasing member, in the side-to-side direction of said cartridge and in the case of the second releasing member in direction parallel to the axis of the reel, to effect releasing and to maintain the released condition.

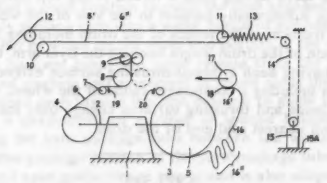


3,971,524

DEVICE FOR CONNECTING AN EXPIRING FIRST WEB OF A WEB-SHAPED MATERIAL WITH THE BEGINNING OF A SECOND WEB OF A WEB SHAPED MATERIAL

Günter Nudinger, Kempten; Heinrich Collin, Munich, and Hans Moosburger, Weiherhammer, all of Germany, assignors to Bayerische Berg-, Hutten- und Salzwerke AG, Munich, Germany

Division of Ser. No. 263,567, June 16, 1972, Pat. No. 3,837,954. This application Oct. 5, 1973, Ser. No. 404,029
Claims priority, application Germany, June 16, 1971, 2129903
Int. Cl.² B65H *19/10*
U.S. Cl. 242—58.4 **20 Claims**



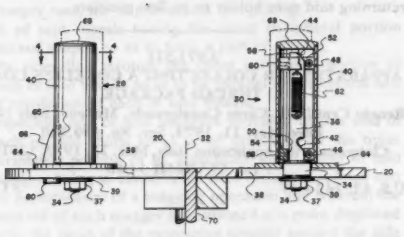
1. In a device for connecting a first web of a web-shaped material unwinding from a first roll to the beginning of a second web of a web-shaped material unwinding from a second roll and having at least one transfer element and releasable engaging means for releasably coupling said second web to said transfer element, said transfer element effecting a pressing of said beginning of said second web to said first web, an adhesive for connecting said first web to said beginning of said second web, and a cutting device for cutting the first web downstream of a point where said second web is attached to said first web, the improvement comprising a guide roller for guiding said first web thereover, first support means for supporting said guide roller for movement along a path generally parallel with an exiting strand of said first web therefrom, resilient means, one end of which is connected to said guide roller, for biasing said guide roller to a first position, weight means, second support means for supporting said weight means, cable means extending between said weight means and the other end of said resilient means, third support means for supporting said cable means to effect a vertical movement of said weight means from off said second support means when the tension force applied by said first web to said guide roller exceeds the return force of said resilient means and the weight of said weight means, the return force of said resilient means increasing as said guide roller is moved along said path away from said first position in response to an increased tension force being applied to said first web, the magnitude of said weiight means and said return force of said resilient means being greater than a normal tension force of said first web on said guide roller during normal operation thereof to thereby effect a holding of said guide roller at said first position.

3,971,525

SEMI-AUTOMATIC HANKING APPARATUS

Arthur Winslow, Fairfield, Conn., assignor to Stanley L. Mead, Portland, Oreg.

Filed Jan. 8, 1975, Ser. No. 539,394
Int. Cl.² B65H *75/24*
U.S. Cl. 242—110 **3 Claims**



1. An apparatus for forming a length of elongate flexible material into a hank containing a predetermined number of loops comprising:
a. a rotatable base member;
b. hanking means attached to said base member for loopingly engaging a length of elongate flexible material as said base member is rotated;
c. means for rotating said base member including an electric motor drive and selectively engagable clutch means for operatively connecting said motor drive to said base member;
d. detector means for producing an electric signal pulse upon each revolution of said base member, and a control circuit, responsive to said signal pulses and including counter means, for maintaining said clutch means engaged with said motor drive until the sum of said signal pulses equals a value preset in said counter means; and
e. means for consistently stopping said base member in a predetermined angular position after it has traversed a number of revolutions corresponding to said preset value in said counter means.

3,971,526

TEXTILE SPOOL

Robert H. Underwood, 19 Stacy St., Saco, Maine 04072

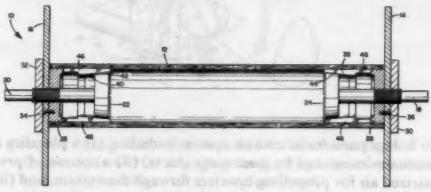
Filed June 2, 1975, Ser. No. 582,716
Int. Cl.² B65H *75/10*
U.S. Cl. 242—118.6 **19 Claims**

1. An improved textile spool adapted to carry a filament material thereon, which spool comprises:
a. a hollow tube adapted to carry a filament material;

b. a first flange at the one end and a second flange at the other end of the hollow tube;

c. a first cylinder at the one end and a second cylinder at the other end of the hollow tube, the cylinders adapted to fit in a slidable, snug relationship within the internal diameter of the hollow tube, at least one of the cylinders characterized by a plurality of slots in the cylinder wall extending generally axially inwardly from one end of the cylinder;

d. a first shaft at the one end and a second shaft at the other end of the hollow tube, the first and second shafts extending axially beyond the first and second flanges, respectively, whereby the extending ends may be placed in a



relationship to rotate the hollow tube for a filament winding or unwinding operation;

e. fastening means to secure in an assembled and disassembled position the first and second flange elements with the first and second ends of the hollow tube on the first and second shaft elements; and

f. means within the interior of the slotted cylinder to provide for the outward expansion of the slotted end of the cylinder wall against the internal diameter of the hollow tube to secure the cylinder to the hollow tube, when the spool is in an assembled position, and to release the cylinder wall so that the hollow tube may be slidably removable therefrom and placed in a dissambled position through the axial movement of the respective shaft element.

3,971,527

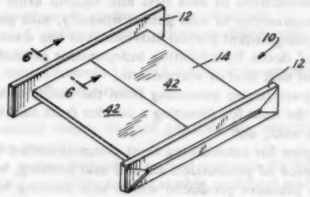
YARN REEL

Robert Maye, 7 Wildwood Gardens, Port Washington, N.Y. 10033

Filed Mar. 14, 1975, Ser. No. 558,352

Int. Cl.² B65H *54/68, 75/06, 75/14*

U.S. Cl. 242—118.7 **25 Claims**



1. A reel for yarn, ribbon and the like which consists of a pair of end pieces and a central member operatively connected therebetween, said end pieces each comprising a single blank of foldable material having a central section, a pair of intermediate sections respectively joined to opposite sides of said central section along at least one fold line and a pair of end sections respectively joined to its adjacent intermediate section along a fold line extending generally parallel to the fold line between its adjacent intermediate section and said central section; said central section having a slot formed therein for receiving said end flanges; said intermediate sections being folded through approximately 180° over said central section about the fold lines therebetween and said end sections being folded through approximately 90° about the fold lines joining them to their associated intermediate sections and extending through the slot in said central section; said central member being connected to the end sections of the respective end pieces to form said reel.

3,971,528

AUTOMATIC STOP DEVICE FOR TAPE RECORDERS

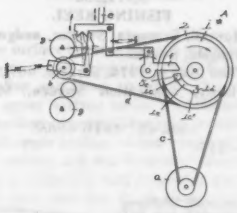
Fumito Komatsu, Suwa, and Sinkichi Yazima, Chino, both of Japan, assignors to Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano, Japan

Filed Feb. 24, 1975, Ser. No. 552,719

Claims priority, application Japan, Feb. 22, 1974, 49-21594

Int. Cl.² B65H *59/38;* **G03B** *1/02;* **G11B** *15/13*

U.S. Cl. 242—191 **10 Claims**



1. An automatic stop device for use with a tape recorder comprising: a fly-wheel which is directly coupled to a drive power source for rotation in conjunction therewith; a detector wheel supported in concentric relationship with said fly-wheel, said detector wheel being coupled with a tape feeding member: clutch means coupling said fly-wheel with the detector wheel so as to allow relative rotational slip between said two wheels responsive to a load greater than a predetermined magnitude being applied to said detector wheel; a striking member protruding in a axial direction responsive to said relative rotational slip so as to cause said wheels to come into collision with a member which is operatingly connected with a playback button of the tape recorder, and being displaced by said member so that the rotational force of said striking member is directly coupled to the fly-wheel at said displaced position; means retracting said striking member after said striking member has struck out said member to thereby release said playback button; and a clutch element of said clutch means being directly positioned on said striking member.

3,971,529

FISHING REEL

Klaus Dörbandt, Berlin, Germany, assignor to Deutsche Angelgerate Manufaktur (DAM) Hellmuth Kuntze Gesellschaft mit beschrankter Haftung K.G., Berlin, Germany

Filed May 15, 1975, Ser. No. 577,893

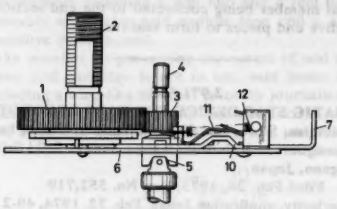
Claims priority, application Germany, June 4, 1974, 2427157

Int. Cl.² A01K *89/00*

U.S. Cl. 242—211 **5 Claims**

1. In a fishing reel, in combination, a slide, a return spring connected with said slide, a shaft, a gear wheel movably mounted upon said shaft, said slide being adapted to engage and move said gear wheel and having a locked position, an input gear wheel, a separate member, means swingably connecting said member in a circumferential direction for a lim-

ited movement with said input gear wheel, and a stop carried by said member and adapted to engage said slide when said



member is swung along with said inlet gear wheel to release the locked position of the slide.

3,971,530

FISHING REEL

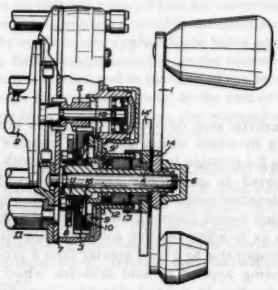
Ake Eugen Murvall, Svangsta, Sweden, assignor to ABU Aktiebolag, Svangsta, Sweden

Filed May 6, 1974, Ser. No. 467,588

Claims priority, application Sweden, May 11, 1973, 7306661

Int. Cl.² A01K *89/02*

U.S. Cl. 242—217 **5 Claims**



1. A fishing reel comprising

a handcrank;

a rotatably driven part;

a transmission connected between said handcrank and said rotatably driven part and including

a shaft,

an adjustable friction clutch mechanism mounted on said shaft including

a gear wheel slidably connected by said adjustable friction clutch mechanism to said shaft,

an element connected for rotary motion with said shaft and supported coaxially with said gear wheel,

a friction ring located between and adjacent to said gear wheel and said element;

friction clutch adjusting means exerting a controllable force to relatively axially move said element and said gear wheel toward each other for mutual frictional engagement through contact with said friction ring;

a slide signal producing means arranged with said friction clutch adjusting means as an axially compact unit and supported by said element and said gear wheel, respectively, at sides thereof facing each other and in positions encompassed by said friction ring and radially inwardly of said friction ring for signal producing mutual engagement during relative rotational movement between said element and said gear wheel.

3,971,531

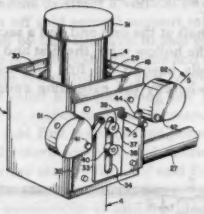
PNEUMATIC COURIER DISPATCH UNIT

Orin H. Davis, 6620 N. 16th Drive, Phoenix, Ariz. 85015

Filed Feb. 20, 1975, Ser. No. 551,307

Int. Cl.² B65G *51/28*

U.S. Cl. 243—25 **6 Claims**



1. In a pneumatic courier system including (i) a plurality of stations connected by pneumatic ducts, (ii) a source of pressurized air for propelling couriers through the system, and (iii) at least one dispatch unit for receiving couriers into the system, said dispatch unit comprising in combination:

a. a housing for receiving the couriers, said housing including an inlet and an outlet;

b. a pair of doors for normally sealing the inlet of said housing, said pair of doors being openable in response to the insertion of a courier into the inlet of said housing, said pair of doors being biased to a normally closed position, each door in said pair of doors including a shaft, each end of which is pivotally mounted to said housing and at least one end of which extends through the external surface of said housing;

c. means for linking the doors of said pair of doors to ensure commensurate movement of each door during insertion of a courier, said linking means comprising in combination:

1. a first arm rigidly affixed to the externally extending end of one of said shafts;

2. a second arm rigidly affixed to the externally extending end of another of said shafts;

3. a slidable guide for interconnecting said first and second arms; and

4. link means disposed intermediate said guide and each of said first and second arms for translating pivotal movement of said first and second arms into sliding movement of said guide; whereby, said guide inhibits independent pivotal movement of one door in said pair of doors by inhibiting independent pivotal movement of said first or second arm;

d. a passageway extending from the outlet of said housing to the duct for directing a courier from said housing into the duct; and

e. a pipe for establishing fluid communication between the source of pressurized air and said housing, whereby, the air pressure produced within said housing by the air inflowing through said pipe forces the courier through said passageway into the duct upon initial insertion of the courier into said passageway.

3,971,532

RUDDER RESTRAINT FOR GROUNDED AIRCRAFT

Craig Fountain, P.O. Box 9067, Moscow, Idaho 83843

Filed Aug. 4, 1975, Ser. No. 601,276

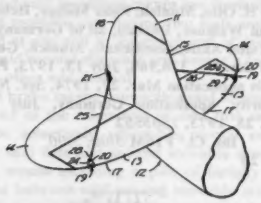
Int. Cl.² B64F *1/00*

U.S. Cl. 244—1 R **5 Claims**

1. A rudder restraint for grounded or stored airplanes, comprising:

a first clamp member for engaging the leading edge of a first horizontal stabilizer of an airplane empennage;

a first nonextendible flexible cord connected at one end to the first clamp member;
a rudder trailing edge engaging bracket connected to the remaining end of the first flexible cord;
a second nonextendible flexible cord connected at one end to the rudder engaging bracket;



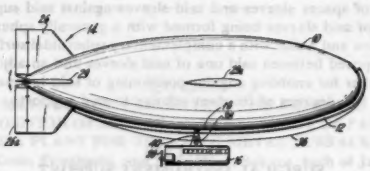
a second clamp member connected to the remaining end of the second cord for engaging the leading edge of a second horizontal stabilizer of the airplane; and
cord tensioning means for holding the cords taut when the first and second clamp members are in position on the leading edges of the horizontal stabilizers and the rudder engaging bracket is engaged with the trailing edge of the rudder.

3,971,533

CONVERTIBLE AIRSHIP

Saul I. Slater, 1427 W. 22 St., Sunset Island 4, Miami Beach, Fla. 33140

Filed Feb. 25, 1975, Ser. No. 552,793
Int. Cl.³ B64B 1/38
U.S. Cl. 244—30 **21 Claims**



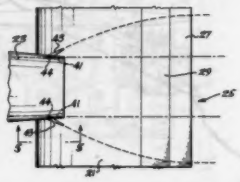
1. A lighter-than-air airship which comprises:
an elongated gas-containing envelope filled with lighter-than-air gas;
stabilizer means mounted to said envelope for stabilizing the orientation of said airship;
a gondola;
remote control means in said gondola for operating said stabilizer means;
propulsion means mounted to said gondola for providing propulsion capability to said airship to propel said airship during flight and stabilize said airship during maneuvering; and
means for slidably and pivotally mounting said gondola to said envelope and for variably positioning said gondola with respect to said envelope to cause rotation of the longitudinal axis of said envelope from a generally horizontal orientation when said gondola is positioned generally at the midsection of said envelope to a generally vertical orientation when said gondola is positioned generally at the nose of said envelope, while said gondola retains a generally horizontal orientation, such that said airship assumes convenient landing characteristics when said longitudinal axis is generally vertical and said airship is capable of substantial flight when said longitudinal axis is generally horizontal.

3,971,534

METHOD OF AND APPARATUS FOR CONTROLLING FLOW ATTACHMENT TO THE WING AND FLAP SURFACES OF AN UPPER SURFACE BLOWING TYPE AIRCRAFT

Charles A. Grotz, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 28, 1973, Ser. No. 429,658
Int. Cl.² B64C 21/00
U.S. Cl. 244—42 CD **11 Claims**



1. In an upper surface blowing aircraft wherein a jet exhaust generated by a jet engine is emitted above the upper surface of a wing and flap and flows chordwise thereover so as to attach to said upper surface under a predetermined set of conditions, a method of controlling said jet exhaust flow attachment to said upper surface of said wing and flap comprising the step of varying only the horizontal divergence of said jet exhaust as it is emitted by said jet engine above said upper surface of said wing and flap so as to control the vertical thickness of said jet exhaust and its attachment to said upper surface.

4. In an upper surface blowing aircraft including at least one jet engine and a wing and flap surface, said jet engine being mounted in a position such that the jet exhaust created by said jet engine is emitted from the nozzle of said jet engine above the upper surface of said wing and flap so as to flow over the upper surface of said wing and flap and attach thereto under a predetermined set of conditions, the improvement comprising means for varying only the horizontal divergence of the jet exhaust as it passes over the upper surface of said wing and flap to control the vertical thickness of the jet exhaust and its attachment to said upper surface of said wing and flap.

3,971,535

OBLIQUE-WING SUPERSONIC AIRCRAFT

Robert T. Jones, Los Altos Hills, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

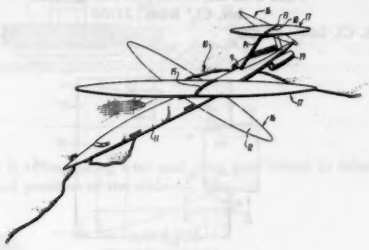
Continuation of Ser. No. 321,180, Jan. 5, 1973, abandoned, which is a continuation-in-part of Ser. No. 206,279, Dec. 9, 1971, Pat. No. 3,737,121. This application Aug. 12, 1974, Ser. No. 496,779
Int. Cl.² B64C 3/40
U.S. Cl. 244—46 **20 Claims**

1. An aircraft having variable airframe geometry for accommodating efficient flight at subsonic, transonic, and supersonic speeds, comprising:
a wing having an approximately elliptic planform, and a curvilinear dihedral formed by the lateral extremities of said wing being curved upwardly from the midspan so as to obtain a substantially elliptical lift coefficient distribution along its length;
a single elongated fuselage pivotally connected to said wing;
means for rotating said wing relative to said fuselage such that in the transonic and supersonic speed regimes said wing is oblique with respect to said fuselage and at takeoff and landing said wing is perpendicular to said fuselage.

6. In an aircraft having a fuselage and a pivotal wing, a method to optimize said aircraft's capabilities at subsonic,

transonic, and supersonic speeds, comprising the following steps:

selecting said wing to have an elliptic planform with a curvilinear dihedral formed by curving the lateral extremities of said wing upwardly from midspan; placing said wing perpendicular to the longitudinal axis of said fuselage at take-off and landing; and



rotating said wing at transonic and supersonic speeds to an angle of yaw relative to said longitudinal axis of said fuselage such that the Mach number of the free airstream normal to the longitudinal axis of said wing is less than the critical Mach number corresponding to the configuration of said wing.

3,971,536

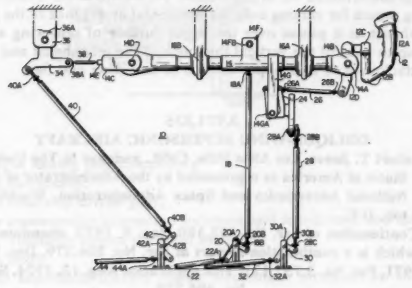
COMBINED HELICOPTER FLIGHT CONTROLLER

John H. Rollins, Jr., Aberdeen, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 10, 1975, Ser. No. 585,627

Int. Cl.² B64C 27/56

U.S. Cl. 244—83 F **9 Claims**



1. A flight control means for helicopters comprising:

integrated control means for generating cyclic and collective control function commands for rotor control heads of the swash plate type;

mounting means comprising a main control shaft for mounting said integrated control means for rotation in a first plane to provide a first cyclic control input, for rotation in a second plane on an axis orthogonal to that of said main control shaft to provide a second cyclic control input, and for translation in a third plaen parallel to said second plane to provide a collective control input;

first displaceable output means responsive to rotation of said integrated control means in said first plane to provide a first cyclic control command;

second displaceable output means responsive to rotation of said integrated control means in said second plane to provide a second cyclic control command; and

third displaceable output means responsive to translation of said integrated control means in said third plane to provide a collective control command.

3,971,537

ADJUSTABLE TRACK MOUNTING DEVICE IN RAIL SYSTEM FOR MAGNETIC-SUSPENSION VEHICLES

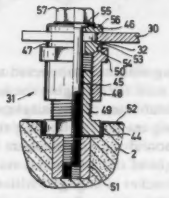
Günther Winkle, Munich; Peter Schwärzler, Fürstenfeldbruck; Peter H. Otto, Munich; Peter Mölzer, Hebertshausen, and Christian Walkner, Dachau, all of Germany, assignors to Krauss-Maffei Aktiengesellschaft, Munich, Germany

Division of Ser. No. 378,966, July 13, 1973, Pat. No. 3,882,790. This application Mar. 27, 1974, Ser. No. 455,323

Claims priority, application Germany, July 17, 1972, 2335036; Jan. 25, 1973, 2303552

Int. Cl.² F16M 5/00, 3/00

U.S. Cl. 248—23 **1 Claim**



1. A device for adjustably mounting a rail-carrying element having a lug member upon a support, especially in the track of a suspension vehicle, said device comprising a nut member anchored in said support, a pair of threadedly interconnected spacer sleeves interposed between said support and said lug member, and a bolt traversing said lug member and said pair of spacer sleeves engaging said nut member, while having a head member adapted to clamp said lug member against said pair of spacer sleeves and said sleeves against said support, one of said sleeves being formed with a generally spheroidal surface and a disk with a complementary spheroidal surface is interposed between said one of said sleeves and an adjoining member for enabling angular positioning of said lug member with two degrees of freedom relative to said support.

3,971,538

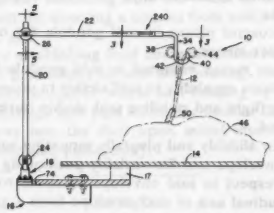
SURGICAL INSTRUMENT SUPPORT

Jack M. Marvich, 3516 Inwood Ave., New Orleans, La. 70114

Filed Sept. 16, 1975, Ser. No. 613,889

Int. Cl.² A47G 29/00; A47F 5/04

U.S. Cl. 248—278 **5 Claims**



1. A device for holding surgical instruments, comprising:

clamping means attached to a table;

mounting means rotatably attached to said clamping means so that said mounting means can be rotated with respect to said table;

a first movable arm having two ends and pivotally connected at one end to said mounting means;

a first brake means connecting said first movable arm at said one end to said mounting means to provide selectively adjustable pivotal engagement between said first movable arm and said mounting means, said first brake means including a pair of facially engaged discs located between said mounting means and said first movable arm one end, each disc having a groove defined in a rear surface thereof in which an outer surface of said first movable arm and said mounting means are respectively engaged;

a second movable arm having two ends and pivotally connected at one end to the other end of said first movable arm, said second movable arm having a longitudinal bore in the other end thereof;

a second brake means connecting said second movable arm one end to the other end of said first movable arm to provide selectively adjustable pivotal engagement between said first and second movable arms, said second brake means including a pair of facially engaged discs located between said second movable arm one end and said first movable arm other end, each disc having a groove defined in a rear surface thereof in which an outer surface of said first and second movable arms are respectively engaged;

an instrument supporting hook detachably mounted on said other end of said second movable arm for supporting surgical instruments, said instrument supporting hook being formed of an autoclavable material; and

locking means on said second movable arm including a lever pivotally mounted on said second arm and having a finger on one end thereof adapted to fit into an access hole in said second arm, and biasing means mounted on said second arm and attached to said lever to bias said finger into said access hole for releasably engaging said supporting hook, to detachably lock said hook to said second movable arm.

3,971,539

METHOD FOR PREVENTING THE ADHESIVE DEPOSITION OF SLUDGE ON THE SURFACE OF PARTS OF A PLANT FOR TREATING METAL SURFACES

Issei Goto, Funabashi, and Suzo Hara, Sakura, both of Japan, assignors to Parker Sangyo Co., Ltd., Tokyo, Japan

Filed Sept. 27, 1973, Ser. No. 401,146

Claims priority, application Japan, Nov. 29, 1972, 47-118870

Int. Cl.² B01K *1/00*; B05B *5/02*

U.S. Cl. 250—529 **5 Claims**

1. In a process for depositing a phosphate film onto the surfaces of metallic articles by spraying a phosphate containing coating solution through applicators onto said articles in which the residual phosphate solution resulting from said spraying is gathered in a recirculating tank equipped with heating coils and then returned through a non-magnetic conduit to said applicator means, wherein a means is provided for preventing deposition of an insoluble phosphate sludge in said applicators, on the inner surfaces of said conduit and on the outer surfaces of said heating coils, the improvement which comprises:

preventing deposition of said phosphate sludge by passing said phosphate coating solution containing phosphate sludge in amounts of 1 to 10 grams/liter through said conduit having a diameter of 2 to 12 inches; and simultaneously

subjecting said solution to a magnetic field from magnets each possessing a magnetic flux of 3000 to 5000 Gauss.

3. The method of claim 1, wherein said solution is continuously recirculated through said conduit and past said magnetic field.

3,971,540

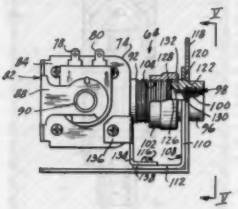
CONTROL VALVE AND MOUNTING ASSEMBLY FOR AN APPLIANCE

Philip Paul Johnson; William F. Gourdeau, and Ronald E. Hahn, all of St. Joseph, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Oct. 4, 1974, Ser. No. 511,989

Int. Cl.² F16L *15/00*; F16K *51/00*

U.S. Cl. 251—143 **6 Claims**



1. A control valve assembly for controlling the flow of liquid supplied under pressure from external plumbing through a conduit to a washing area within the cabinet of an appliance, said control valve assembly comprising:

an electrically operated control valve for selectively providing fluid communication between the external plumbing and the conduit;

a swivel connector including

a mounting bracket for attaching said connector to the cabinet, said mounting bracket including first and second portions,

a fixed portion having a fluid passageway therein for connection to the external plumbing, said fixed portion connected to said first portion of said mounting bracket, and

a movable portion releasably connecting said fixed portion in communication with said control valve; and

grounding means connecting said control valve to the cabinet,

said grounding means including an adjustable registration device orienting said control valve with respect to the cabinet and placing said control valve and the cabinet at the same electrical potential, said grounding means electrically connected to said control valve and including a portion commonly connected to the cabinet with said second portion of said mounting bracket.

3,971,541

MANUALLY OPERABLE SELF-CLOSING VALVE

Raymond E. Griffin, 9442 W. Pine, Mokena, Ill. 60448

Filed Jan. 3, 1975, Ser. No. 538,363

Int. Cl.² F16K *31/44*

U.S. Cl. 251—347 **9 Claims**

1. A manually operable self-closing valve comprising:

first and second body members having end surfaces in face to face relationship;

the first body member having a port formed therein;

a plug rigidly mounted on the second body member and adapted to seal said port;

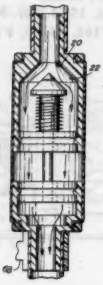
an elastic tube fitted longitudinally over said body members and forming a liquid-tight connection therebetween so that the space between said end surfaces is in liquid communication with said tube;

said elastic tube normally urging said plug and port into valve sealing engagement and being longitudinally responsive to linear forces applied to the opposite ends and parallel to the longitudinal axis thereof; and

means on said body members for releasably connecting one or the other thereof into the discharge line of a liquid system.

said valve being operable, after connection of one of said body members into a discharge line, by applying a linear

force to the free body member and pulling the same away from the connected body member to open the valve and



further separate said end surfaces and releasing the same whereupon said elastic tube automatically urges the valve closed.

3,971,542

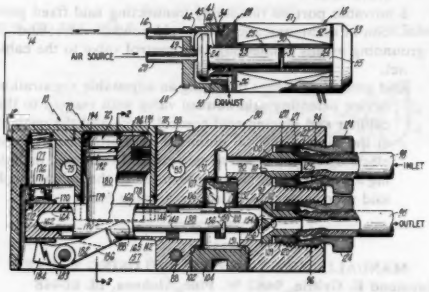
FLUID VALVE AND VALVE SYSTEM

Leighton Lee, II, Guilford, Conn., assignor to The Lee Company, Westbrook, Conn.

Filed July 5, 1974, Ser. No. 485,789

Int. Cl.² F16K *31/12*

U.S. Cl. 251—58 **14 Claims**



1. In a valve comprising a valve body with passageway means therein including fluid passageway means with a valve operating chamber, a valve member shiftable within the valve operating chamber for controlling the flow through the fluid passageway means, and valve operating means for shifting the valve member for controlling the fluid flow through the fluid passageway means, the improvement wherein the valve operating means comprises a valve member operating lever pivotally mounted within said valve body passageway means and having a lever arm at one end of the operating lever for pivoting the operating lever for shifting the valve member, wherein the valve body is a one-piece plastic valve body with an integrally formed imperforate enclosed tubular projection receiving the lever arm and forming therewith a lever combination, the tubular projection completely enclosing the lever arm within said plastic valve body passageway means and being flexible to permit pivoting the lever combination and thereby pivot the lever arm enclosed therein for shifting said valve member, and wherein the valve operating means further comprises means for pivoting the lever combination for shifting the valve member.

3,971,543

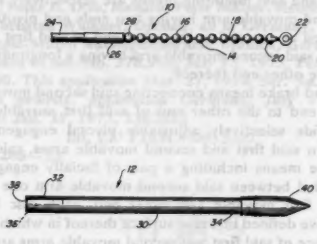
TOOL AND KIT FOR ELECTRICAL FISHING

William F. Shanahan, 2306 S. 3rd St., Philadelphia, Pa. 19148

Filed Apr. 17, 1975, Ser. No. 569,146

Int. Cl.² E21C *29/16*

U.S. Cl. 254—134.3 R **4 Claims**



1. A tool for fishing for electrical wires and the like comprising a magnet means and a multi-part sensor assembly; said sensor assembly comprising a chain and a rod-shaped contactor connected to one end of said chain, said chain and said rod-shaped contactor being comprised of magnetically attractable materials and being connected by a connecting sleeve which encompasses part of said contactor and part of said one end of said chain; at least some of the parts of said sensor assembly having differing magnetic properties whereby varying forces are encountered when said sensor assembly is drawn across said magnet means.

3,971,544

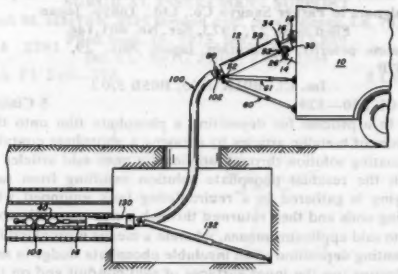
APPARATUS FOR GUIDING A ROD INTO A CONDUIT

Raymond W. Smith, Jr., Texarkana, Ark., assignor to Rockwell International Corporation, Pittsburgh

Filed Nov. 5, 1975, Ser. No. 628,868

Int. Cl.² H02G *1/00*

U.S. Cl. 254—134.3 FT **16 Claims**



1. Apparatus for inserting rod into a conduit comprising, a length of rod wound on a reel spaced from said conduit, an elongated support one end of which is positioned adajcent the end of said rod when wound on said reel, a guide conduit extending between the other end of said support and the conduit into which said rod is to be inserted, removable cover means on said support extending substantially the length of said support whereby said support and said cover provide conduit means to guide the end of said rod into said guide conduit when said rod is unwound from said reel.

3,971,545

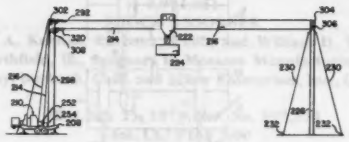
FLUID ACTUATED DYNAMIC BRAKE

Charles P. Warman, P.O. Box 1550, Wichita Falls, Tex. 76307

Continuation-in-part of Ser. No. 245,754, April 20, 1972, abandoned, which is a continuation-in-part of Ser. No. 883,517, Dec. 9, 1969, abandoned, which is a division of Ser. No. 706,575, Feb. 19, 1968, Pat. No. 3,500,764. This application Dec. 21, 1972, Ser. No. 317,407

Int. Cl. B66d *1/48*

U.S. Cl. 254—173 R 11 Claims



1. A dynamic braking friction-coupled device to constantly rotate a friction element with respect to a driven friction element, including a first fluid pressure actuated device comprising:

a. a first power drive unit,

1. a first shaft,

2. a load controlling device,

3. a load moving device mounted on said first shaft,

b. a second shaft,

1. friction clutch means mounted on said second sahft and connected in power driven relation with said first power drive unit, and with said load moving device on said first shaft,

2. fluid pressure actuated means in fluid communication with said clutch to selectively engage said friction elements within said clutch,

3. liquid cooling conduits leading to and through said friction clutch means to circulate a coolant to dissipate heat thereof,

c. a second power drive unit,

1. gearing means connected to said second power drive unit,

2. a dynamic braking mechanism mounted on said first shaft and connected with said gearing means to control the torque on said first shaft,

3. sensing means to selectively sense the change in load on the load moving device to control the air input to the air actuated device and said dynamic brake to control the degree of engagement of said friction elements.

3,971,546

ANIMAL CROSSING GUARD

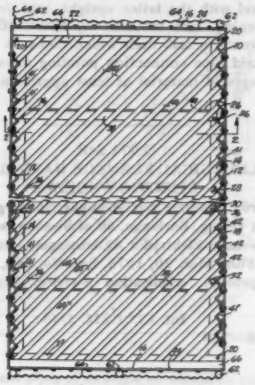
A. J. Bruner, 2166 Katherine St., Fort Myers, Fla. 33901

Filed Apr. 21, 1975, Ser. No. 569,702

Int. Cl.[2] A01K *3/00*

U.S. Cl. 256—14 5 Claims

1. An animal crossing guard allowing the passage of vehicular traffic while preventing the passage of hooved animals thereover comprising, in combination, a rectangular frame having longitudinal and end members with vertical flanges each having a series of bolt holes therealong, brackets each having two faces normal to each other, one of said faces containing an aperture, said brackets each having flanges with each flange extending on an obtuse angle from one of said faces, said flanges each having a bolt hole therethrough, bolts extending through said bolt holes of said flanges and said bolt holes of said vertical flanges of said frame with said brackets being disposed adjacent to each other along said vertical flanges within said frame with said faces of said brackets being in vertical planes, and bars extending between said vertical flanges into the apertures of said bracket faces, said brackets supporting said bars spaced distances apart from and parallel



to each other and extending across said frame at an angle to said vertical flanges forming a grid therein.

3,971,547

APPARATUS AND METHOD FOR REFINING METAL

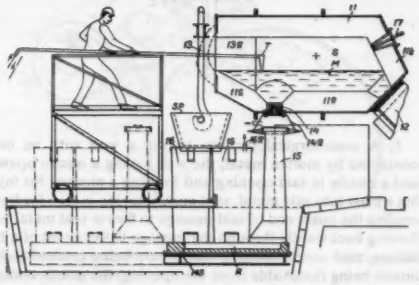
Bengt Fredrikson, Vasteras, and Karl-Erik Öberg, Hagfors, both of Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Aug. 22, 1974, Ser. No. 499,759

Claims priority, application Sweden, Aug. 23, 1973, 73114647

Int. Cl.[2] C21C *5/46*

U.S. Cl. 266—244 1 Claim



1. A metal-refining converter comprising an elongated vessel for containing a melt to be refined and which tilts so that it can be positioned upright or horizontal, said vessel having an upper end having a charging opening provided with a removable gas-tight cover and a lower end provided with a channel-type inductor and the vessel having a closable tap hole in its side which is downward when the vessel is horizontal, said vessel having an internal contour permitting it when horizontal to hold said melt with a space above the melt, and said inductor having a channel positioned to receive and heat the melt when the vessel is horizontal, said vessel having means for injecting pressurized-gas into said space when the vessel is horizontal, said inductor's channel extending downwardly from said lower side and forming a sump for retaining a portion of said melt after the latter is tapped from said vessel when the vessel is horizontal, and said inductor's channel extending diagonally with respect to said vessel's longitudinal axis so that the inductor can produce heat via said melt por-

tion retained in said sump, when the vessel is tilted upright, said vessel having at least one pipe connection for injecting melt-refining material into the lower portion of a melt charged in said vessel with the latter upright, said cover having an exhaust opening, said inductor by Pinch effect producing stirring currents in said melt which come to a focus in the melt, and said pipe connection pointing towards said focus and injecting said material at least approximately into said focus.

3,971,548

METALLURGICAL FURNACE HAVING A BLAST INJECTION NOZZLE

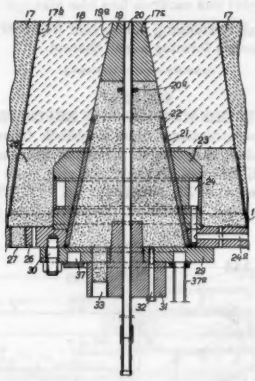
Kåre Folgerö, Vasteras; Lars-Gunnar Norberg, Hagfors, and Karl-Erik Öberg, Borlange, all of Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Mar. 20, 1975, Ser. No. 560,204

Claims priority, application Sweden, Mar. 20, 1974, 7403730

Int. Cl.² C21C 5/48

U.S. Cl. 266—218 **5 Claims**



1. A metallurgical furnace having a wall with an inside contacted by molten metal, the wall having a nozzle opening, and a nozzle in said opening and forming a passage for injecting a blast into said metal, said nozzle having means for liquid-cooling the outer end of said passage to freeze said metal when flowing backwardly through the passage in the event of a blast failure, said nozzle opening and nozzle being conical and the nozzle being removable from the opening, the nozzle comprising a metal conical shell having an outer flange for connection with the outside of the vessel's said wall, said flange having an opening into said shell and through which a fluent refractory material can be injection molded into the shell, a pipe extending longitudinally through the shell and flange forming a blast passage.

3,971,549

PROCESS AND APPARATUS FOR TREATING AND TRANSFERRING METAL IN THE LIQUID STATE

Alan L. Habig, 4048 Lehigh Blvd., Decatur, Ga. 30034

Filed Mar. 5, 1975, Ser. No. 555,438

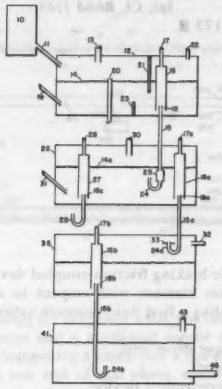
Int. Cl.² C21B 13/14

U.S. Cl. 266—215 **7 Claims**

1. Apparatus for transferring metal in the molten state from a first zone to a second zone at a lower level by gravity flow which comprises

a. a transfer pipe communicating between said zones with its open upper end terminating below the normal level of liquid within said first zone and with its lower end terminating in a dip leg trap within said second zone;

b. a gas pressure pipe having a larger inside diameter than the outer diameter of the transfer pipe said gas pressure pipe being positioned within said first zone so as to surround and extend below the upper inlet end of said transfer pipe; and



c. means for introducing a gas under pressure into said gas pressure pipe,

whereby exertion of gas pressure within the gas pressure pipe will cause the level of liquid in the annulus between the two pipes to be forced below the inlet of the transfer pipe.

3,971,550

EYE-BUSH

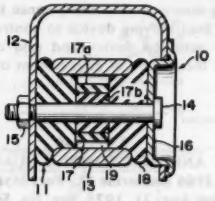
Chikara Matsuoka, and Yuichi Amano, both of Aichi, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Jan. 21, 1975, Ser. No. 542,752

Claims priority, application Japan, Jan. 25, 1974, 49-10665

Int. Cl.² F16F 7/12

U.S. Cl. 267—57.1 R **4 Claims**



1. An eye-bush for use with a load carrying member for absorption of radial loads applied thereon, comprising a cylindrical elastic bushing which is adapted to fit elastically within a hollow cylindrical eye portion formed on the load carrying member while being laterally firmly clamped in and by portions of a holding bracket disposed adjacent the opposite ends of said eye portion, said cylindrical bushing having a pair of axial outer cylindrical portions which engage said holding bracket portions respectively and which are spaced from one another by a coaxial intermediate cylindrical bushing portion having a diameter less than that of said outer portions, said intermediate portion of said elastic bushing comprising a plurality of stratified annular layers of different elastic materials disposed in superposed coaxial relation to one another about the axis of said bushing and comprising an inner annular

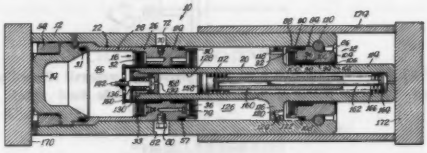
layer and an outer annular layer, said inner annular layer being fabricated of a material having a greater hardness than the material of said outer annular layer, the outer annular layer of said intermediate portion having an outer diameter which is smaller than the inner diameter of the eye portion of the load carrying member to define a gap between the inner surface of said eye portion of said load carrying member and the outer surface of said outer annular layer.

3,971,551

SHOCK ABSORBER

Giles A. Kendall, Burbank, Calif., and William D. Wallace, Northfield, Ill., assignors to Menasco Manufacturing Company, Burbank, Calif. and Miner Enterprises, Inc., Chicago, Ill.

Filed July 21, 1975, Ser. No. 597,575
Int. Cl.² F16F 5/00
U.S. Cl. 267—65 R **9 Claims**



1. A shock absorber comprising an elongated casing with a primary chamber therein, a piston rod having a variable volume auxiliary chamber therein and extending at its rear end into said primary chamber, said piston rod having aperture means adjacent said rear end thereof for placing said primary and auxiliary chambers in communication, valve means adjacent said aperture means and normally disengaged therefrom, a compressible medium filling said primary and auxiliary chambers, said variable volume auxiliary chamber accommodating changes in volume of said compressible medium resulting from changes in temperature of said medium, said valve means being engaged with said aperture means for closing the latter and interrupting communication between said primary and auxiliary chambers as said rear end of said piston rod initially moves into said primary chamber, and said compressible medium in said primary chamber providing a damping and spring force on said piston rod as said rear end of said piston rod thereafter moves into said primary chamber and reduces the volume of said compressible medium therein.

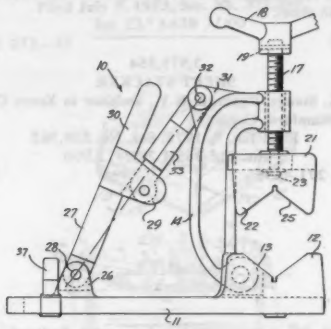
3,971,552

QUICK RELEASE PIPE VISE

Johnny W. Mayfield, 4505 Greenstone Road, Placerville, Calif. 95667

Filed Nov. 12, 1975, Ser. No. 631,308
Int. Cl.² B25B 1/14
U.S. Cl. 269—228 **3 Claims**

1. A pipe vise including a base plate, a plurality of spaced parallel V-shaped pipe jaws rigidly secured to said base plate, a generally C-shaped upper jaw frame member having its lower end pivotally secured to a pair of said jaws on said base plate with a generally horizontal pivot, an upper jaw member, hand controlled means extending through the upper end of said frame member for moving said upper jaw member along said frame member toward said lower jaws, and an over center linkage extending between the upper end of said frame member and said base plate at an angle to releasably rigidly support said frame member in upright position.

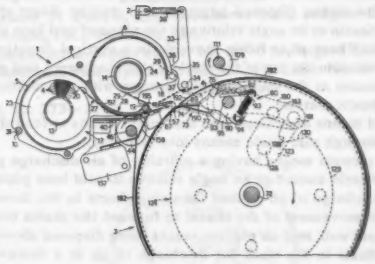


3,971,553

AUTOMATIC SHEET CHANGING SYSTEM FOR REPROGRAPHIC MACHINES

Nicola Cosmo, Ivrea (Turin), Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Filed Aug. 26, 1975, Ser. No. 607,868
Claims priority, application Italy, Sept. 2, 1974, 69662/74
Int. Cl.² B65H 5/12
U.S. Cl. 271—3 **10 Claims**



1. An automatic sheet changing system for a reprographic machine comprising:

a sheet receiving member;

retaining means actuatable for retaining a sheet onto said sheet receiving member;

a feed reel;

a take-up reel;

a flexible support wound from said feed reel to said take-up reel;

a plurality of sheets positioned regularly spaced on said support and interwound with the support on said feed reel;

means mounting said feed reel and said take-up reel on the machine with the portion of said flexible support extending from the feed reel to the take-up reel passing adjacent the gripping elements of said receiving member;

means operative in a sheet changing cycle for removing a used sheet from the sheet receiving member;

means operative during said cycle for advancing a predetermined length of flexible support along said path by unwinding it from the feed reel and rewinding it to the take-up reel;

means for separating a fresh sheet advancing with the support along said path during said cycle and for guiding the fresh sheet to the retaining elements; and

means for actuating the retaining elements to retain the fresh sheet.

3,971,554

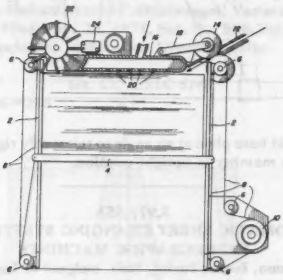
SHEET STACKER

Klaus K. Stange, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 9, 1975, Ser. No. 539,763

Int. Cl.² B65H *29/24, 31/10*

U.S. Cl. 271—195 **1 Claim**



1. A sheet stacking apparatus for receiving and stacking sheets including:

a sheet tray having a planar base plate for stacking sheets thereon and a side wall for abutting sheets thereagainst;

guide means disposed adjacent said tray to direct sheets therein at an angle relative to the plane of said base plate, said base plate being movable in a vertical direction to maintain the top of the stacked sheets adjacent said guide means as the stack height increases with the addition of sheets thereto;

feed means associated with said guide means to feed sheets through said guide means into said tray;

air plenum means having a plurality of air discharge ports therein canted at an angle relative to said base plate for discharge of air against incoming sheets in the direction of movement of the sheets to forward the sheets toward said wall, said air plenum means being disposed above the sheets in the stack for discharge of air in a downward, angled direction;

said air plenum means being mounted for limited movement in a vertical direction, discharge of air therefrom causing said plenum means to float above the sheet stack;

indexing means adapted for vertically indexing said base plate; and,

switch means adapted for contact by said plenum means when the height of the sheets in the stack causes said plenum means to float above a predetermined level, said switch means being adapted to energize said indexing means to lower said base plate and the sheets stacked theron to provide space above the stack for receipt of subsequent sheets presented thereto.

3,971,555

MULTIPURPOSE BODY EXERCISING MACHINE

Parker E. Mahnke, Glendale, Calif., assignor to Marcy Gymnasium Equipment Co., Glendale, Calif.

Continuation of Ser. No. 356,518, May 2, 1973, abandoned.

This application Feb. 6, 1975, Ser. No. 547,435

Int. Cl.² A63B *21/06*

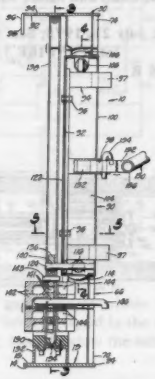
U.S. Cl. 272—118 **6 Claims**

1. A body-exercising machine comprising:

a. an upright supporting structure having vertical tracks generally "C" shaped in cross-section and having a pair of generally arcuate wheel engaging portions and a pair of flanges extending generally at right angles to each other and interconnecting said wheel engaging portions;

b. a vertically reciprocative carriage mounted in and guided by said tracks, said carriage being provided with wheels which have generally arcuate shaped peripheries adapted to engage said wheel engaging portions of said tracks and said wheels further including generally conically shaped hub means adapted to engage said flanges of said tracks upon lateral movement of said wheels relative to said tracks;

c. adjustable resistance means for varying the load against a user, said resistance means comprising a plurality of



vertically movable apertured weights, a bar supporting said weights, said bar being supported in said upright structure and positioned below said carriage and connected directly to and biasing said carriage downwardly;

d. body-engaging means on said carriage for engagement and movement by a user only in vertical straight line direction and being adjustable, whereby the body-engaging means may be adjusted to different starting positions on the carriage; and

e. vertical guide means disposed within said upright structure between said vertical track means for vertically guiding said weights upon vertical movement of said vertically reciprocative carriage, said guide means comprising a pair of guide rods extending through said weights, said guide bars being located on opposite sides of said weight supporting bar.

3,971,556

COMBINATION BOOK END AND DUMBELL APPARATUS AND METHOD OF UTILIZING SAME

Robert D. Petrie, 28890 W. Chicago, Livonia, Mich. 48150; Thomas E. Wensley, 22034 Gregory, Dearborn, Mich. 48124; Charles Watkins, 19401 Newburg Road, Livonia, Mich. 48151, and Juan Gaminde, 29610 Grandon, Livonia, Mich. 48150

Filed Oct. 10, 1974, Ser. No. 513,886

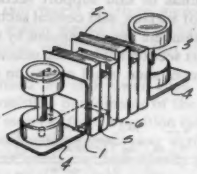
Int. Cl.² A63B *11/00*

U.S. Cl. 272—122 **5 Claims**

1. A device for physical exercise removeably mounted on a supportive apparatus for books and other office material;

said supportive apparatus comprises at least one horizontal member with a stud affixed to a first section of said horizontal member, a tongue comprising a second section of said horizontal member, a vertical member affixed to said horizontal member at the end of said tongue toward said stud;

said device for physical exercise comprises a dumbbell having a short bar between two enlarged end portions, with one end portion of said device being flat on the bottom side with at least one cavity, shaped and oriented



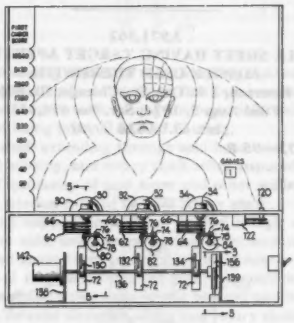
to mate with said stud, so that said device may be readily removed from said apparatus, the said end portion being of any suitable geometric shape, the short bar between the said end portions being long enough to accept a clenched fist.

3,971,557

CHANCE AMUSEMENT DEVICE

Jeffrey D. Breslow, Highland Park, and Eugene Jaworski, Park Ridge, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Mar. 13, 1975, Ser. No. 558,064
Int. Cl.² A63F 9/00
U.S. Cl. 273—1 E 19 Claims



1. A game apparatus, comprising:

a base having a plurality of stations thereon;

a plurality of independently actuatable signal devices having a normal deactivated state and a second activated state mounted on said base, at least one at each station;

means to randomly activate the signal devices at only one station at a time;

a plurality of independently movable opaque covers, one at each station, for covering the signal device thereat and mounted for movement between a normal first position covering the associated signal device and a second position uncovering the associated signal device for observance by players of the game; and

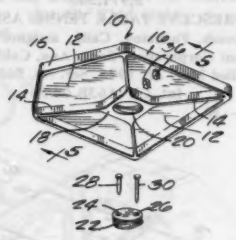
a plurality of selectively and independently actuatable cover moving means operable by a player of the game, one for each station and operatively associated with the cover thereat, for moving the cover from its first position to its second position to expose the signal devices thereunder.

3,971,558

BASE MARKER FOR BASEBALL

Alfred D. Gardetto, 16880 West Sundown Court, New Berlin, Wis. 53151

Filed July 9, 1973, Ser. No. 377,493
Int. Cl.² A63B 71/00
U.S. Cl. 273—25 2 Claims



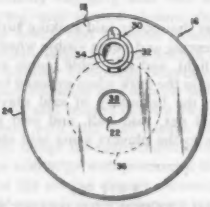
1. A baseball base marker comprising a flat polygonal shaped plate having at least one opening in the central portion thereof, a plug dimensioned to removably fit within said opening, means for removably securing said plug to said plate within said opening, and at least two spikes of unequal length attached to said plug and projecting downwardly therefrom for securing said plate to the ground, said plate having recessed portions in its lower surface, said spikes being removably attached to said plug, and a clip attached within one of said recessed portions of said plate adapted to grip and hold said spikes within said recessed portion to store said spikes therein.

3,971,559

WEIGHTING DEVICE FOR ATTACHMENT TO BASEBALL BATS

Mariano P. Diforte, Jr., Baltimore, Md., assignor to Bat Weight, Inc., Baltimore, Md.

Continuation-in-part of Ser. No. 397,713, Sept. 17, 1973, abandoned. This application Aug. 23, 1974, Ser. No. 499,905
Int. Cl.² A63B 69/40
U.S. Cl. 273—26 R 11 Claims



1. A weighting device for attachment to a conventional baseball bats including:

a. a collapsible member of substantially doughnut shape having a bore, the size of which permits the handle portion of the bat to be passed through the bore while effecting frictional engagement of the portion of the member defining the bore with the barrel portion of the bat, for preventing relative longitudinal movement of said member with respect to the bat, when the latter is swung,

b. said collapsible member comprising a pair of like, opposed, annular walls of flexible sheet material,

c. means for sealing together the inner edges and outer edges respectively of said walls to provide an annular chamber therebetween,

d. a substantially rigid stiffener of annular shape fixed to said collapsible member proximate the bore thereof for controlling the stretching of said walls when engaged with a baseball bat,

e. weighting substance, and

f. valve means in one of said walls for admitting said weighting substance to the annular chamber for use of the device, and to permit removal of said weighting substance therefrom, for collapsing the member.

3,971,560

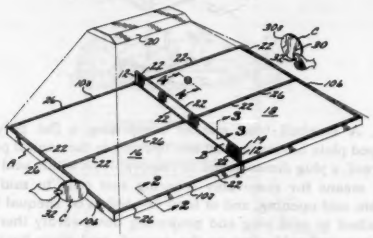
FLUORESCENT TABLE TENNIS ASSEMBLY

James L. Panosh, Fullerton, Calif., assignor to Alpha Nova Development Corporation, Santa Ana, Calif.

Filed Mar. 21, 1975, Ser. No. 560,691

Int. Cl.[2] A63B 69/36

U.S. Cl. 273—30 2 Claims



1. In combination with a source of ultra violet light, a tennis table assembly that may be used in the dark that includes a flat, horizontal, rectangular surface, a transverse vertically extending net that divides said surface into first and second portions, a resilient hollow ball, and a pair of paddles that define striking surfaces thereon, said table tennis assembly being characterized by:

a. first means that outline the outer boundary of said surface, said first means fluorescing and being visible when exposed to said ultra violet light;

b. second means that outline the edges of said net, said second means fluorescing and being visible when exposed to said ultra violet light;

c. third means carried on said ball, said third means fluorescing and being visible when exposed to said ultra violet light; and

d. fourth means that cover said striking surface, said fourth means fluorescing and being visible when exposed to said ultra violet light, and said table tennis assembly capable of being used in the dark when exposed to said ultra violet light due to the boundary of said playing surface, the edges of said net, said ball, and said striking surfaces being visible to the players using said assembly.

3,971,561

STORABLE MULTI-USE CHILDREN'S EXERCISING ASSEMBLY

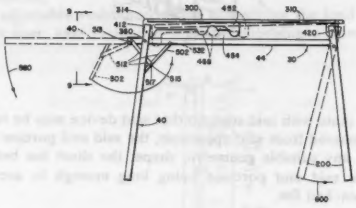
Le Roy S. Wenzel, 630 S. 124th Ave., Omaha, Nebr. 68154

Filed July 20, 1973, Ser. No. 381,358

Int. Cl.[2] A63G 21/00; A63B 17/04

U.S. Cl. 272—56.5 R 5 Claims

1. A collapsible children's exercising assembly comprising: three elongated sections comprising a central section and first and second support sections, section-connecting means connecting said sections together and permitting movement of said sections into storage positions alongside each other and also permitting movement of said sections into slide positions in which said central section inclines downwardly in general parallelism with and also end-to-end relationship with said first support section, when said sections are in said slide position said second support section being disposed upwardly extending and transverse to said central section and at least mostly beneath said central section, and also said section-connecting means permitting movement of said sections into a Jungle Gym position in which said support sections both extend transversely downwardly from and are approximately normal to said central section, said section-connecting means causing the ends of said central section to be firmly supported by said first and second support sections respectively when said sections are in said slide and Jungle Gym positions and while lower ends of said support sections are rested on a horizontal floor surface, said central section having two longitudinal side members interconnected by transverse rungs, said second support section having step means thereon to facilitate climbing thereon, slide panel means on said central and first



support sections, and attachment means attaching said slide panel means on said central and first support sections when said sections are in said slide positions, whereby said slide panel means provides a substantially continuous slide surface along the majority of the length of said central and first support sections and whereby said slide panel means will stay in place on said central and first support sections during sliding useage by children and whereby that part of said slide panel means which is disposed on said central section is removable from said central section to permit free use of said rungs when said assembly is in said Jungle Gym position.

3,971,562

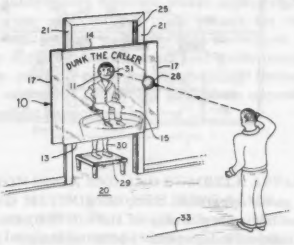
ROLLABLE SHEET HAVING TARGET APERTURE AND MISSILE USED THEREWITH

C. Robert Peterson, 2 E. Oak St., Chicago, Ill. 60611

Filed Aug. 5, 1974, Ser. No. 494,415

Int. Cl.[2] A63B 71/02

U.S. Cl. 273—95 R 3 Claims



1. A target game comprising:

a flexible sheet member having a front surface, a rear surface, a lower edge and at least one other edge adapted to be removably secured to stationary support means; said sheet member having such surface integrity as to be adapted to be rolled to form a self-supporting cylinder upon removal from said support means for insertion into a container for storage;

adhesive means, disposed on said rear surface near said other edge, for removably securing said sheet member to said support means; said adhesive means being permanently maintained on said rear surface for reuse after said

sheet member is removed from, and subsequently resecured to, said support means;

indicia means, disposed on said front surface, for representing a corporeal presence;

means defining target aperture means, communicating between said front surface and said rear surface of said sheet member; said target aperture means being associated with said indicia means for accommodating a target to be displayed within the context of said indicia means; and

access means, defined by said lower edge of said sheet member, for permitting participants of the game to pass under said sheet member from a position facing said front surface to a position facing said rear surface, whereby each of said participants can individually put their face into said target aperture means to lend a personal quality to said corporeal presence.

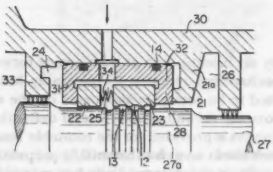
3,971,563
SHAFT SEALING APPARATUS USING A FLUID SEALING SYSTEM

Shojiro Sugimura, Okayama, Japan, assignor to Mitsui Shipbuilding and Engineering Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 397,654, Sept. 17, 1973, abandoned. This application Apr. 3, 1975, Ser. No. 564,852

Int. Cl.² F16J *15/16, 15/40*

U.S. Cl. 277—27 **6 Claims**



1. A shaft sealing apparatus using a sealing fluid comprising:

a housing having first inner and first outer walls, said first inner and outer walls having a substantially axial symmetry and being internal to said housing;

a rotary shaft extending through said inner and outer walls of said housing, said rotary shaft being disposed along the axis of symmetry of said inner and outer walls;

a sealing portion formed on said rotary shaft;

a seal ring supporting member having a high and a low pressure side, and having second inner and outer walls disposed around said sealing portion on said rotary shaft, said seal ring supporting member disposed within said first inner and outer walls of said housing and being slideable in an axial direction along said rotary shaft, said seal ring supporting member having a sealing fluid supply chamber being supplied with a sealing fluid;

a first seal ring disposed in slideable contact with an outer peripheral surface of said sealing portion of said rotary shaft adjacent to said low pressure side of said seal ring supporting member;

a second seal ring disposed in slidable contact with the outer peripheral surface of said sealing portion of said rotary shaft adjacent to said low pressure side of said seal ring supporting member, said second seal ring and sealing portion of said rotary shaft forming a labyrinthine chamber;

a spring means arranged between said first and second seal rings for urging said seal rings into contact with said second inner walls of said seal ring supporting member; and

a means for displacing said seal ring supporting member in an axial direction to vary the amount of said slidable contact of said seal rings with said sealing portion of said rotary shaft.

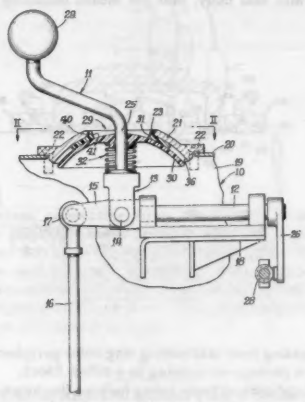
3,971,564
ENVIRONMENTAL SEALS FOR MULTIDIRECTIONAL CONTROL LEVERS

Robert B. Bowen, Edwards; Roger F. Maier, Peoria, and John R. Rediger, Washington, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed May 24, 1974, Ser. No. 473,139

Int. Cl.² F16J *15/16*

U.S. Cl. 277—30 **16 Claims**



1. In an apparatus having wall means having an opening defined by an edge wall portion, and a movable member extending through and being transversely movable across said opening, and sealing structure for sealingly closing said opening about said movable member including a first closure element extending laterally outwardly from said movable member for movement directly therewith, a second closure element disposed between said first closure element and said wall means and having a first surface portion sealingly slidably engaging said first closure element and a second surface portion sealingly slidably engaging said wall means outwardly about said opening, said second closure element having an opening through which said movable member extends and which is substantially larger in cross section than the portion of the movable member extending therethrough, and means biasing said closure elements into slidable sealing engagement with each other and said second closure element into slidable sealing engagement with said wall means, the improvement comprising a stop flange on said second closure element arranged to engage said edge wall portion of the wall means in a limit position of the second closure element for limiting the movement of said second closure element transversely across said wall means opening, the transverse extent of said elements being preselected to be, in all transverse directions across said wall means opening, cumulatively greater than the transverse extent of said wall means opening whereby said two closure elements maintain said wall means opening effectively sealingly closed in all positions of said transversely movable member.

3,971,565
SEAL ASSEMBLY FOR PILLOW BLOCK HOUSING

Joseph H. Schickling, Collegeville; John L. Blake, Jr., Willow Grove, and Walter Hyduk, Southampton, all of Pa., assignors to SKF Industries, Inc., King of Prussia, Pa.

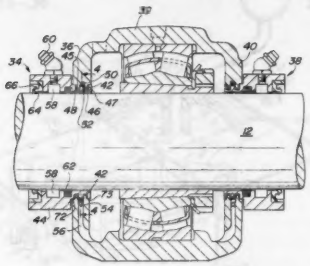
Filed May 27, 1975, Ser. No. 581,384

Int. Cl.² F16J *15/32*

U.S. Cl. 277—59 **11 Claims**

1. A nonrotatable seal assembly for use in a pillow block comprising

a. a cylindrical body having a length in an axial direction which is substantially longer than the thickness thereof in a radial direction, said body having a first end portion longitudinally spaced from a second end portion,
b. said first end portion having two spaced grooves on its outer periphery, each groove being adapted to receive an annular rib on a pillow block housing,
c. a deformable sealing ring on the outer periphery of said body at said first end portion between said grooves,
d. a pin means extending through said deformable sealing ring into said body, said pin means including a portion



projecting from said sealing ring outer periphery for entry into a passage or opening in a pillow block,
e. said cylindrical body being hollow, the inner peripheral surface of said body at said second end portion having a lubrication recess positioned between first and second annular seals, a lubrication fitting on said body communicating with said recess, and
f. the inner peripheral surfaces of said first end portion being a smooth uninterrupted surface having a diameter slightly greater than the inner diameter of said first and second seals.

3,971,566

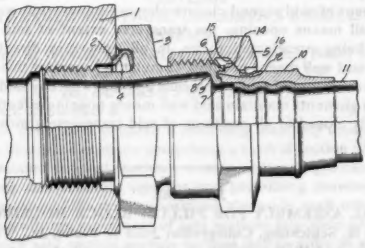
HYDRAULIC SEALING MEMBER AND PROCESS

Richard Levinsohn, deceased, late of Menlo Park, Calif.; Joseph Levinson, administrator-with-will-annexed, Los Angeles, and James E. Jervis, Menlo Park, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 239,395, March 29, 1972, abandoned, which is a division of Ser. No. 70,321, Sept. 8, 1970, Pat. No. 3,759,552. This application Jan. 6, 1975, Ser. No. 538,740

Int. Cl.² F16J *15/08*

U.S. Cl. 277—206 R **11 Claims**



1. A metallic V-ring sealing member capable of sealing hydraulic fluid against egress from a hydraulic system having an operating temperature range within the range of from about −54°C to about 232°C, said sealing member being formed from a metal alloy which (a) undergoes transition from an austenitic state to a martensitic state when cooled below a transition temperature, said temperature being below about −60°C (b) undergoes a further transition from the martensitic to the austenitic state upon warming from below said temperature to a temperature less than the operating temperature of said system, (c) remains in the austenitic state within the operating temperature range, and (d) is weaker in its martensitic state than in its austenitic state whereby a seal may be formed between a sealing surface of the sealing member and a sealing surface of the hydraulic system with substantially no galling or scratching of either sealing surface.

3,971,567

SAFETY SKI BINDING

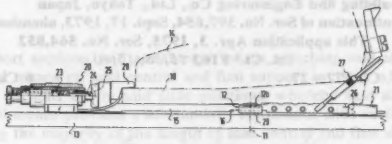
Brigitte Sittmann, Stuttgart, Germany, assignor to Vereinigte Baubeschlagfabriken Gretsch and Co. GmbH, Germany

Filed June 11, 1974, Ser. No. 478,358

Claims priority, application Germany, June 12, 1973, 2329832; Feb. 20, 1974, 2408162

Int. Cl.² A63C *9/08*

U.S. Cl. 280—618 **40 Claims**



1. A safety ski binding with at least one of forward and rear retaining mechanisms operable to releasably hold a ski boot that is adapted to be rotatably supported on the ski, against a lifting off from the ski and against lateral deflections, wherein a retaining means is provided for the rotatable bearing support of the ski boot about an axis substantially perpendicular to the ski surface, said retaining means which is rotatably supported on the ski about said axis and includes lateral extensions, being operable to hold the ski boot by means of said lateral extensions against a lateral displacement in the transverse direction of the ski, the lateral extensions being operable to couple with each other the retaining means and the ski boot in the direction of rotation, yet permit a lifting off of the ski boot in a direction substantially perpendicular to the ski,

wherein the ski boot is retained on the ski by the retaining mechanisms by way of a sole plate means adapted to be clamped to the boot, wherein the lateral extensions surround the sole plate means on both sides, and

wherein the lateral extensions engage into lateral notches of the sole plate means.

3,971,568

SELF-SUPPORTING NESTING CART

Leonard E. Wright, Paradise Valley, Ariz., assignor to Tradewind Industries, Inc., Liberal, Kans.

Filed Jan. 31, 1975, Ser. No. 546,104

Int. Cl.² B62B *11/00*

U.S. Cl. 280—33.99 H **15 Claims**

1. A self-supporting combination folding and nesting cart, comprising:

a first end frame having a side portion;

a back frame assembly comprising:

a corner post having a nesting cavity;

a lower cross member having one end connected to and extending normal to the side portion of the first end frame, the other end of the lower cross member connected to the corner post; and

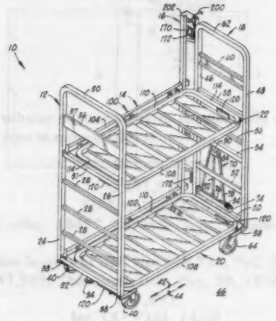
a mid-horizontal cross member having one end connected to and extending normal to the side portion of the first end frame, the other end of the mid-horizontal cross member connected to the corner post;

a second end frame pivotally connected to the corner post and selectively positionable in a folded position wherein the second end frame is adjacent to the back frame assembly, and in an extended position wherein the second end frame is normal to the back frame assembly and parallel to the first end frame;

wheel means for movably supporting the first end frame, the second end frame and the back frame assembly;

a first shelf pivotally connected to the lower cross member and selectively positionable in a folded-in position wherein the first shelf is parallel to and against the back frame assembly, and in a folded-out position wherein the first shelf is normal to the first end frame, the second end frame and the back frame assembly;

a second shelf spatially removed from the first shelf and pivotally connected to the mid-horizontal cross member, the second shelf being selectively positionable in a folded-in position wherein the second shelf is parallel to and



against the back frame, and in a folded-out position wherein the second shelf is normal to the first end frame, the second end frame and the back frame assembly, the cart being in an L-shaped profile when the first shelf and the second shelf are in the folded-in position and the second end frame is in the folded position;

a hook member pivotally supported by the top of the corner post member and projecting therefrom a distance determined to be hookingly engageable with the nesting cavity of another cart of like construction placed in nesting relation to the cart when both carts are in the L-shaped profile, nesting relation being defined as having the first end frames and the back frame assemblies of both carts being respectively in adjacent and parallel relationship; and

spring means connected to the hook member for biasing the hook member in hooking engagement with the nesting cavity of the other cart.

3,971,569

SAFETY SEAT BELT DEVICE WITH AN INFLATABLE CUSHIONING MEANS

Fumiyuki Abe, Yokohama, and Syuichi Otani, Tokyo, both of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed Feb. 19, 1974, Ser. No. 443,618

Claims priority, application Japan, Feb. 21, 1973, 48-20188

Int. Cl.² B60R *21/08*

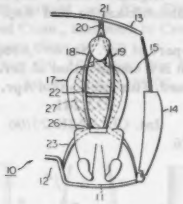
U.S. Cl. 280—733 **4 Claims**

1. A safety seat belt device for use in a motor vehicle having a floor and a roof cooperably defining an occupant compartment in which an occupant seat is mounted on said floor, said safety seat belt device comprising:

a lap belt having one end secured inward of said seat to said floor and the other end adapted to be held outward of said seat;

a yoke type shoulder belt including first and second belts, said first and second belts respectively having upper ends thereof adapted to be held at said roof, lower ends thereof secured to said lap belt at transversely spaced positions;

air bag means fixedly mounted on said lap belt between the lower ends of said first and second belts so that upon collision of said motor vehicle, an air bag of said air bag means is expanded toward said upper ends of said first and second belts; and



a transverse connecting strap transversely arranged between respective lower portions of said first and second belts so that upon expansion of said air bag of the air bag means, said transverse connecting strap holding, in combination with said first and second belts, the expanded air bag between said transverse connecting strap and a torso portion of a seated occupant.

3,971,570

BELT LOCKING ARRANGEMENT FOR A PASSIVE BELT SYSTEM FOR AUTOMOBILES

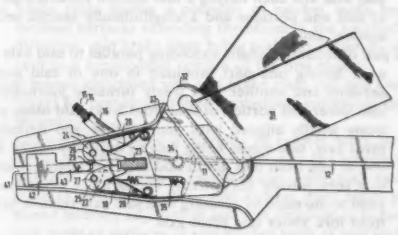
Karl Erik Nilsson, Rontgenstrasse 30, 8012 Ottobrunn, and Reiner van Riesen, Besenheide 36, 2200 Elmshorn, both of Germany

Filed Mar. 3, 1975, Ser. No. 554,702

Claims priority, application Germany, Mar. 1, 1974, 2409835

Int. Cl.² B60R *21/10*

U.S. Cl. 280—746 **5 Claims**



1. A belt locking arrangement for a passive safety-belt system for automotive vehicles having a forwardly hinged vehicle door, wherein a belt lock is movable in a guide on the inner surface of the door into and out of locking engagement with a lock tongue secured to the body of the vehicle, by an auxiliary power drive, said arrangement comprising, in combination, a guide sleeve built into the door and formed with a slot opening toward the interior of the vehicle; a flexible push-pull member running in said guide sleeve and connected to said auxiliary drive for operation thereby; and a transporter slide extending through said slot and connected to said push-pull member and to said belt lock; said lock comprising two substantially U-shaped cover plates spaced from and extending parallel to one another to define therebetween an open forward-facing gap for said lock tongue; a pair of symmetrically formed claws pivotally mounted between the front ends of said cover plates; said claws having oblique faces directed

toward the front and opposing each other in the zone of said forward-facing gap; and respective return springs biasing said claws to engage their oblique faces with each other.

3,971,571

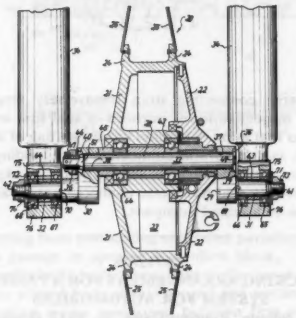
FRONT WHEEL SUSPENSION UNIT FOR MOTORCYCLES

Koji Yoshioka, Higashi-Osaka, Japan, assignor to Kayabakogyokabushikikaisha and Koji Yoshioka, both of Tokyo, Japan

Continuation-in-part of Ser. No. 499,886, March 11, 1974, abandoned, which is a continuation of Ser. No. 113,558, Feb. 8, 1971, abandoned. This application Apr. 30, 1975, Ser. No. 573,241

Int. Cl.[2] B62K *25/06*

U.S. Cl. 280—276 5 Claims



1. A motorcycle front wheel suspension unit, comprising

a telescopic front fork having a lower end portion;

a front wheel provided with a center hub having opposite axial ends;

an axle freely rotatably journalled in said hub and having end portions which extend outwardly past said axle ends;

a pair of elongated link members extending transversely of said axle and each having a first section mounted on one of said end portions and a longitudinally spaced second section; and

a pair of mounting shafts extending parallel to said axle and each having one part mounted in one of said second sections and another part freely turnably journalled in said lower end portion of said front fork, said other parts being axially aligned with one another and defining a pivot axis, said wheel being free to normally rotate relative to said front fork about said axle, but when subjected to a substantially horizontally acting force being free to yield to the same by pivoting with said axle relative to said front fork about said pivot axis.

3,971,572

MAGAZINE COVER

Stanley O. Fenkel, Elkins Park, Pa., assignor to David Anthony Desimone, N.J., a part interest

Filed May 20, 1975, Ser. No. 579,093

Int. Cl.[2] B42D *3/00*, *17/00*

U.S. Cl. 281—46 2 Claims

1. A binder for magazines, said binder comprising:

a. a front cover portion;

b. a back cover portion;

c. a hinge portion hingedly connected at its opposite edges to said front and back cover portions;

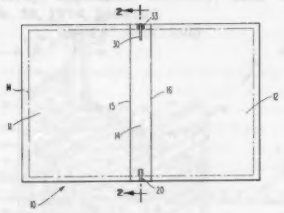
d. a first single fixed L-shaped finger having base and leg portions, said base portion being fixed to said hinge portion at one end of the hinge portion and said leg portion projecting inwardly above the hinge portion at a spaced distance therefrom, said spacing forming a first slot at one end of said hinge portion for receiving an edge portion of the center-fold portion of a magazine;

e. a second single L-shaped finger having base and leg portions;

f. a flexible strap pivotably connecting said base portion of said second finger to the opposite end of said hinge portion;

g. locking means at said opposite end of said hinge portion;

h. said locking means comprising a pair of spaced upstanding ears, each ear having a boss projecting inwardly toward the other ear;



i. said base portion of said second finger being provided with bosses extending laterally outwardly therefrom and adapted to be cammed past the inwardly extending bosses of said ears to lock said finger between said ears;

j. said second finger being pivotable inwardly on said flexible strap from an outwardly extending position to an inwardly extending position with its base portion disposed between said ears and its leg portion spaced above the hinge portion, said space forming a second slot for receiving and retaining said magazine at said opposite edge of its center-fold portion with said losses on the base portion of said second finger cooperating with the inwardly extending bosses of said ears to lock said second finger between said ears.

3,971,573

TRAIL LINE MOVES

Lloyd W. Clements, Woodland, Calif., assignor to Ireco Industries, Inc., Eugene, Oreg.

Division of Ser. No. 415,825, Nov. 14, 1973, abandoned, which is a division of Ser. No. 252,587, May 12, 1972, Pat. No. 3,807,638. This application Apr. 7, 1975, Ser. No. 565,797

Int. Cl.[2] F16L *55/00*

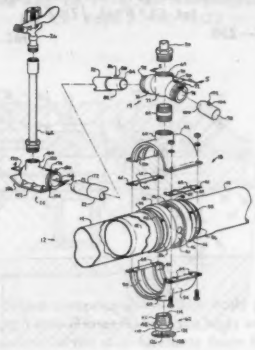
U.S. Cl. 285—5 3 Claims

1. For use in an irrigation line move including a rotatable horizontal line pipe having lateral ports and a swivel housing rotatable on the pipe around the ports, an irrigation trail line structure including

a cross connector having a vertical tubular portion having a bottom, pipe connecting portion connected to a port in the housing and also having an upper, sprinkler connecting portion,

the cross connector also having a tubular cross-arm, extending outwardly and downwardly from the vertical tubular portion and having a connector outer end portion adapted to

connect to a trail line, the downward slope of the cross-arm being such as to so compensate for drag from the trail line



that the tubular portion remains substantially vertical when the line pipe is moved laterally.

3,971,574

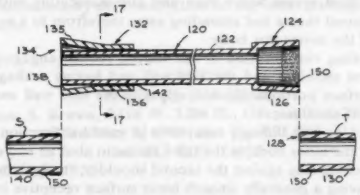
PIPE COUPLING

Hoyt S. Curtin, 10477 Laramie Ave., Chatsworth, Calif. 91311

Continuation-in-part of Ser. No. 329,727, Feb. 5, 1973, Pat. No. 3,857,588. This application Dec. 30, 1974, Ser. No. 537,093

Int. Cl.² F16L *13/10*

U.S. Cl. 285—31 **2 Claims**



1. A coupling for joining first and second pipes having open ends spaced from one another by a predetermined distance, said coupling comprising:

a pipe section including an elongated portion having an outer diameter smaller than the outer diameter of said first and second pipes;

said pipe section having a total length substantially equal to said predetermined distance and further including an enlarged tubular portion formed on a first end thereof, said tubular portion defining an inner surface having a diameter slightly larger than the outer diameter of said first pipe for adhesive mounting on said first pipe; and

a sleeve slidable along said pipe section elongated portion having a substantially smooth internal surface including a first portion having a diameter slightly larger than the outer diameter of said pipe section elongated portion for axial sliding movement of said sleeve therealong and for adhesive mounting thereto and a second portion having a diameter slightly larger than the outer diameter of said second pipe for adhesive mounting thereto, said sleeve having a substantially smooth external surface free of securing means;

said sleeve second portion internal surface being tapered such that its diameter decreases from its free end toward said sleeve first portion from a diameter slightly greater than the outer diameter of said second pipe to a diameter slightly smaller than the outer diameter of said second pipe.

3,971,575

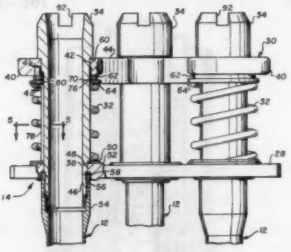
RELEASABLE LOCKING DEVICE

Adam Lesham, Bloomfield, and Glen Elwin Schukei, South Windsor, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Nov. 29, 1974, Ser. No. 528,121

Int. Cl.² F16L *15/00*

U.S. Cl. 285—85 **11 Claims**



1. A releasable locking device for urging limited relative rotation about a longitudinal axis between a first and a second object threadedly coupled together so as to maintain a tight connection of the coupled objects, the locking device comprising:

a brake plate having a plurality of ratchet teeth having inclined surfaces extending therefrom in the longitudinal direction, said brake plate being positioned laterally adjacent to a longitudinal portion of the first object;

first means associated with said brake plate and said second object for preventing relative rotational movement therebetween;

a locking plate having a plurality of ratchet teeth having inclined surfaces extending therefrom in the longitudinal direction and being complimentary with said ratchet teeth of said brake plate, said locking plate being positioned laterally adjacent to said first object so as to permit said inclined surfaces of said ratchet teeth of said locking plate and said brake plate to mate with each other;

second means associated with said locking plate and said first object for preventing relative rotational movement therebetween;

at least one of said brake plate and said locking plates being longitudinally movable relative to said first object to move said ratchet teeth into and out of mating engagement; and

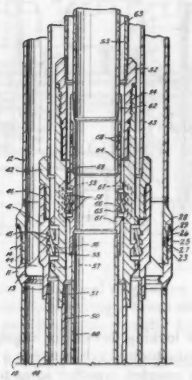
means for normally biasing said locking plate and said brake plate toward one another to mate said inclined surfaces thereof, the biasing force applied by said biasing means being transmitted through said inclined surfaces to urge relative rotation of said locking plate and said brake plate to apply a tightening force between said first and second objects, said biasing means being releasable to permit one of said objects to be freely rotated relative to the other of said objects and positioned to bear against said second object and said at least one longitudinally movable plate.

3,971,576

UNDERWATER WELL COMPLETION METHOD AND APPARATUS

David P. Herd, Houston, Tex., and John H. Fowler, Pittsburgh, Pa., assignors to McEvoy Oilfield Equipment Co., Houston, Tex.

Division of Ser. No. 103,839, Jan. 4, 1971, Pat. No. 3,800,869, which is a continuation of Ser. No. 792,912, Jan. 22, 1969, abandoned, which is a continuation-in-part of Ser. No. 728,081, May 9, 1968, Pat. No. 3,442,536, which is a continuation of Ser. No. 572,511, Aug. 15, 1966, abandoned. This application Aug. 13, 1973, Ser. No. 387,667
Int. Cl.² F16L *37/24*
U.S. Cl. 285—87 9 Claims



1. A pipe joint for connecting first and second pipes of a pipe string passing through a body of water and driven into the sea floor comprising:

a first tubular member affixed to the first pipe;

a second tubular member affixed to the second pipe, said first tubular member having a portion thereof insertable within said second tubular member;

a plurality of circumferentially spaced groupings of teeth disposed on both of said members;

the pipes being connectable upon a rotation of one of the pipes in a common plane, said common plane being perpendicular to the axis of rotation;

stop means on one of said members engageable with means on the other member to limit said rotation to less than one revolution;

said teeth disposed on one of said members having surfaces engageable, when an axial tension load is placed on the pipe joint, with cooperable surfaces on teeth disposed on the other of said members; said cooperable surfaces being in planes perpendicular to said axis of rotation, thereby avoiding any substantial radial load on the pipe joint upon the application of axial tension loads; and

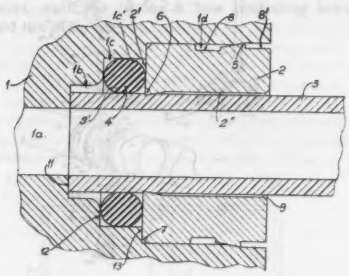
abutting support means on said tubular members to transmit axial compression loads applied to the pipe joint whereby the pipe joint is capable of sustaining axial tension loads, axial compression loads, and bending moments caused by the driving of the pipe string into the sea floor and by the water currents.

3,971,577

UNION DEVICE FOR FLEXIBLE TUBING

Gerard Schemith, Pontarlier, France, assignor to Scovill Manufacturing Company, Waterbury, Conn.

Filed Aug. 16, 1974, Ser. No. 498,129
Int. Cl.² F16L *17/02*
U.S. Cl. 285—238 9 Claims



1. A connector for rapid, fluidtight connecting to a flexible tubular member, comprising:

a connecting body having therein an inner bore and having, coaxially with the bore at an end thereof, a first recess wider than and communicating with the bore and extending away from it, a first annular shoulder extending outwardly from the first recess remotely from the bore, a second recess wider than and communicating with the first recess and having a side wall extending from a periphery of the first shoulder away from that shoulder, a second annular shoulder extending outwardly from an end of the side wall remotely from the first shoulder, and a third recess wider than and communicating with the second recess and extending away therefrom to a surface of the connector body;

a sealing ring inserted in the second recess, engaging the first shoulder and the side wall and having sealing ring surface portions exposed opposite the side wall and the first shoulder;

a locking ring slidingly receivable in use, in a direction axial of the inner bore, in the third recess to abut an end of the locking ring against the second shoulder, the locking ring having a generally smooth inner surface receptive in use, in a direction axial of the inner bore, of an end portion of a flexible tubular member for engagement of an outer surface portion of the tubular member's end portion with one of the exposed surface portions of the sealing ring, the locking ring having an end surface at said end thereof engageable with the other exposed surface of the sealing ring to compress the sealing ring against the first shoulder and thereby against the side wall of the second recess and the outer surface portion of the tubular member's end portion; and

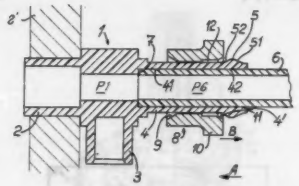
inner and outer barbs on the locking ring, the outer barb being disposed on an outer surface of the locking ring and being inclined relative thereto to oppose withdrawal of the locking ring, once received in the third recess, from the connecting body, and the inner barb being disposed on the generally smooth inner surface of the locking ring and being inclined relative thereto, oppositely to the inclination of the outer barb, to oppose withdrawal of the flexible tubular member from the locking ring once the tubular member is received therein;

thereby enabling rapid locking of the tubular member to the connecting body through the locking ring, while also enabling simultaneous fluidtight connecting of the tubular member with the connecting body through the sealing ring compressed by the locking ring.

3,971,578
UNION DEVICE FOR FLEXIBLE TUBING

Gerard Schemith, Pontarlier, France, assignor to Scovill Manufacturing Company, Waterbury, Conn.

Filed Aug. 16, 1974, Ser. No. 498,128
Int. Cl.² F16L 31/00, 33/22
U.S. Cl. 285—260 2 Claims

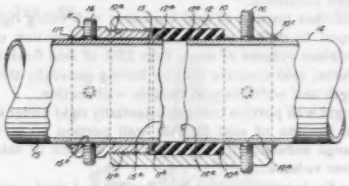


1. A union device comprising; a hollow body providing an internal passage; a sleeve integral with the body and extending therefrom to an end of the sleeve remote from the body and enabling introduction of an end part of a flexible tube resistant to radial deformation; an outer annular embossment surrounding a portion of the sleeve adjacent the end thereof; and means for radially, releasably compressing the embossment to strengthen the tight holding of the end part of the tube in the bore of the sleeve; the sleeve being resiliently deformable radially and having a bore with an inner diameter which, prior to the introduction of the end part of the tube, is slightly less than the outer diameter of the tube, the sleeve and bore having a length at least approximately equal to twice said inner diameter, to enable the end part of the tube, upon the introduction thereof into the end of the sleeve, to be removably push-fitted into and tightly held in the bore of the sleeve, to place an inner passageway, provided by the tube, in communication with the internal passage provided by the hollow body with substantially no constriction of the inner passageway of the tube.

3,971,579
WELD CLAMP SEAL

William A. Brown, 2418 W. 12th St., Odessa, Tex. 79760

Filed May 5, 1969, Ser. No. 821,731
Int. Cl.² F16L 19/07
U.S. Cl. 285—353 5 Claims



1. A weld clamp for sealing off any leakage of fluid contained in a metal pipeline when same is severed with ragged end faces comprising:

a. a stationary sleeve adapted to be telescoped over a first end portion of said pipeline and extend over a second end portion of said pipeline where same was severed,

b. a plurality of set screws extending through said stationary sleeve for securely connecting it to the first end portion,

c. a radial right angled shoulder in the stationary sleeve,

d. internal threads in the stationary sleeve,

e. a compression sleeve having a radial right angled end face adapted to be telescoped over the second end portion of said pipeline,

f. a plurality of setscrews extending through said compression sleeve for securing it to the second end portion,

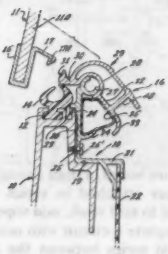
g. external threads on the compression sleeve screwed into the internal threads of the stationary sleeve, and

h. a compressible ring in the stationary sleeve extending from the radial right angled shoulder in the stationary sleeve to the radial right angled end face of the compression sleeve and adapted to compress upon both the first end portion and the second end portion of said severed pipeline to form a fluid seal with each.

3,971,580
DUAL RELEASABLE WINDOW LATCH MECHANISM FOR TRANSIT VEHICLE

Keith W. Tantlinger, Coronado, and Theodor C. Schubach, Bonita, both of Calif., assignors to Rohr Industries, Inc., Chula Vista, Calif.

Filed May 21, 1975, Ser. No. 579,440
Int. Cl.² E05C 15/02
U.S. Cl. 292—201 11 Claims



1. In a transit vehicle having a row of hingedly suspended windows along each side thereof, a dual releasable latch mechanism including a latch for each of said windows, each latch comprising:

a latch base member mounted adjacent the lower edge of each of said windows,

a latch member mounted for rocking movement on each latch base member, and manually rockable thereon by a passenger within the vehicle between latching engagement with, and release of, its respective window,

an inflatable element concealed in each of said latches between an element of its latch base member and an element of its latch member, each of said inflatable elements being positioned, upon inflation, to rockingly urge its respective latch member toward window releasing condition,

duct means interconnecting the inflatable elements of a selected plurality of said latches, and

operator controlled valve means for communicating said duct means with a supply of pressurized fluid for simultaneously inflating all of such plurality of inflatable elements and thereby rocking their respective latch members toward unlatched, window releasing condition.

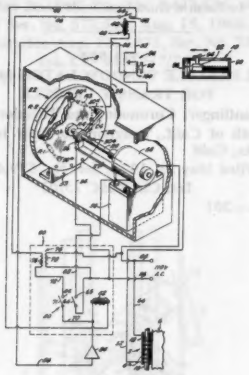
3,971,581
VARIABLE MAGNETIC LOCK

Tom C. Montgomery, Box 421, Big Springs, Tex. 79720

Filed June 17, 1974, Ser. No. 479,694
Int. Cl.² E05C 19/16
U.S. Cl. 292—251.5 10 Claims

1. In combination with an enclosure having a door hingedly secured thereto: an electric current responsive lock means positioned to hold said door closed, said electric current responsive lock means comprising: an electromagnet having a coil secured about a ferrous core, a magnetic attracting element attached to the enclosure, and means securing said core

to said door; an electric current supply; means for connecting the lock means to the electric current supply to activate the lock means; and control means adapted to vary the electric current supplied to the lock means to thereby adjust the force required to disengage the lock means, said control means comprising: a circuit board, electrically conductive contacts



spaced about the circuit board, a shaft rotatably secured to the circuit board, a wiper attached in series with the current supply source secured to said shaft, said wiper being postionable to selectively complete a circuit with one of said contacts, resistors connected in series between the contacts and the current supply, and means to rotate the shaft.

3,971,582

DOOR LATCH

Brooks Walker, 807 Francisco St., San Francisco, Calif. 94109

Filed Nov. 13, 1974, Ser. No. 523,199

Int. Cl.² E05C *17/06*

U.S. Cl. 292—268 **4 Claims**

1. In a door structure that includes a frame, and a door having a hinge edge and an opposite latch edge, a safety latch for holding said door against opening, comprising:

a bar swingably supported at one of its ends on said door structure,

a keeper mounted on said frame adjacent said latch edge of the door,

said keeper being formed with a horizontally outwardly opening slot for receiving the opposite end of said bar therealong,

said slot having a vertically offset portion for receiving said opposite end therein to prevent opening of the door,

a second keeper swingably connected to said first mentioned keeper,

said second keeper being formed with an elongated slot having an open end adjacent said first mentioned keeper and in alignment with the slot in said first mentioned keeper when said keepers are in substantially coplanar relation,

whereby said opposite end of said bar may be moved along said elongated slot to the inner end thereof to permit said door to be partially opened to a position against said bar.

3,971,583

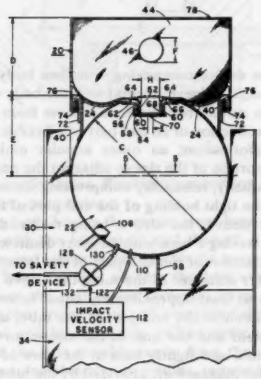
ENERGY ABSORBING BUMPER SYSTEM

Murray Kornhauser, Wynnewood, Pa., assignor to Safety Consultants, Berwyn, Pa.

Continuation-in-part of Ser. No. 126,155, March 19, 1971, Pat. No. 3,810,668. This application Jan. 4, 1974, Ser. No. 430,667

Int. Cl.² B60R *19/10*

U.S. Cl. 293—71 P **50 Claims**



1. A bumper apparatus for a vehicle comprising:

an elongated container having a volume containing a compressible gas,

an elongated impact receiving portion of the container wall being flexible under impact and shaped to define a substantial section of said container volume in the unflexed condition and to reduce the container volume in the flexed condition,

and another portion of said container wall being rigid and shaped to define a substantial concave section of said container volume of more than 25% of said flexible wall volume, said concave section having generally the same length and width as said flexible wall section,

said rigid wall portion being substantially rigid under impact and flection of said flexible wall portion so as not to change substantially the rigid wall section of said container volume,

means for interconnecting said flexible and rigid sections to transmit fore and aft tension forces from said flexible wall portion in line to said rigid wall concave section and to permit substantially free passage of the compressible gas from the flexible section to the rigid section upon impact so that the gas is at substantially the same pressure in the rigid section as in the flexible section at all times during impacts on said impact wall at speeds within the design impact velocity range of the apparatus,

and means for attaching said rigid wall section to the exterior of a vehicle with the flexible section projecting therefrom as a bumper therefor,

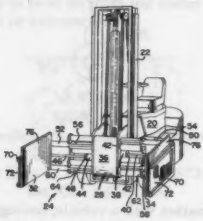
whereby upon impact the rise in the gas pressure in said container is limited as impact energy is absorbed by gas compression.

3,971,584

AUTOMATIC LOAD COMPENSATING CLAMP TRUCK JAWS

Alexander William Duncan, Clayton, N.C., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Mar. 17, 1975, Ser. No. 558,635
Int. Cl.[2] B66C 1/44; B66F 9/18
U.S. Cl. 294—88 5 Claims



1. Load engaging and gripping apparatus for attachment to the lifting mechanism of a lift truck for handling loads, said apparatus comprising:

a lift assembly adapted for mounting on the lift mechanism of a lift truck;

opposed load engaging and gripping means including opposed load engaging and gripping platens; and

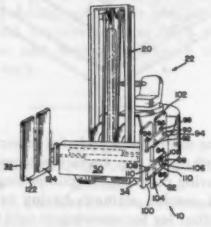
means for connecting said opposed load engaging and gripping means to said lift assembly, said means including a carrier plate connected to opposite ends of said lift assembly and a slide bearing means cooperatively mounted on said carrier plate and each one of said opposing load engaging and gripping platens, said slide bearing means including a plurality of bearing assemblies each with an angularly disposed bearing rod and a bearing slidably carried thereon whereby said opposed load engaging and gripping means are in light frictional contact with a load under at rest conditions and move inwardly toward one another to firmly grip the load therebetween when the lift assembly is moved vertically upward.

3,971,585

LOAD ENGAGING AND GRIPPING APPARATUS

Richard G. LaBudde, Batavia, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Mar. 17, 1975, Ser. No. 558,779
Int. Cl.[2] B66C 1/44; B66F 9/18
U.S. Cl. 294—88 6 Claims



1. Load engaging and gripping apparatus for attachment to the lifting mechanism of a lift truck for handling loads, said apparatus comprising:

a lift assembly including reciprocable support means adapted for mounting on the lifting mechanism of a lift truck;

opposed load engaging and gripping means including engaging and gripping platens movably affixed to said reciprocable support means of said lift assembly, said movable affixation of said platens providing inward and outward travel thereof in response to vertical movement of said lift assembly; and

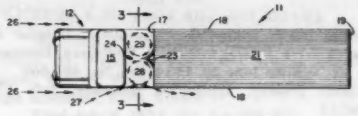
power means in the form of a pair of double acting hydraulic piston and cylinder assemblies mounted on said lift assembly with one of said pair of assemblies connected to each of said opposed platens to provide inward and outward movement therebetween whereby frictional contact of a load by said platens is effected by said power means and added inward and outward movement of said platens is effected by said movable attachment to said lift assembly upon vertical movement of said lift assembly.

3,971,586

DRAG REDUCER FOR LAND VEHICLES

Walter Selden Saunders, 307 Thornhill Road, Baltimore, Md. 21212

Division of Ser. No. 283,774, Aug. 25, 1972, Pat. No. 3,854,769. This application Oct. 17, 1974, Ser. No. 515,490
Int. Cl.[2] B62D 35/00
U.S. Cl. 296—1 S 21 Claims



1. In a vehicle having a gap formed by a first set of facing sides oriented perpendicular to the line of motion of the vehicle defined by a leading panel of a trailing element of said vehicle and a trailing panel of a leading element of said vehicle wherein the leading panel of the trailing element has a vertical height from the ground at least substantially equal to the vertical ground height of said trailing panel, and a second set of facing sides defined by slip streams along the line of motion of the vehicle; at least one drag reducing member mounted on one of said first sets of facing sides and comprising at least one surface which extends into said gap both horizontally and vertically sufficiently to define with said first set of facing sides at least one elongated cell for stabilizing at least one vortex therein, the periphery of said cell and said vortex being defined and confined by said surface, a portion of said first set of facing sides, and said slip stream along at least one of said second set of facing sides when the vehicle is moving through a fluid.

3,971,587

U-SHAPED FURNITURE FRAME

William R. Curtis, New Castle, and David C. Trimble, Yorklyn, both of Del., assignors to Hercules Incorporated, Wilmington, Del.

Filed Sept. 30, 1975, Ser. No. 618,199
Int. Cl.[2] A47C 7/02
U.S. Cl. 297—452 7 Claims

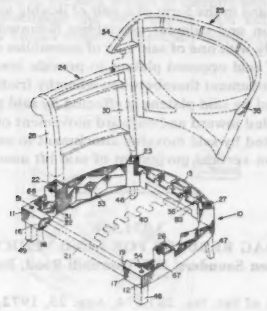
1. A furniture frame for a barrel shaped chair comprising:

an integral U-shaped member made of plastic material, each end thereof having an inwardly projecting box portion for receiving a horizontal support member;

said ends being movable toward and away from each other due to the flexure of the U-shaped member to accommodate various lengths of support members to form a chair of varying widths;

said U-shaped member having means intermediate the ends

thereof formed therein in the top thereof for receiving vertical arm supports; and



said U-shaped member having means formed therein in the bottom thereof for receiving legs.

3,971,588

FRAME FOR THE BODY OF A VEHICLE

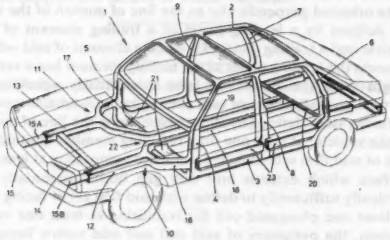
Andreas Bauer, Fallersleben, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed June 20, 1974, Ser. No. 481,069

Claims priority, application Germany, July 17, 1973, 2336213

Int. Cl.² B62D 21/00

U.S. Cl. 296—28 R 8 Claims



1. Frame for the body of a vehicle comprising:

a roof frame;

a base frame;

at least two vertical corner columns joining the roof and base frames into a box-like structure surrounding a passenger space;

a vehicle bumper with bumper shanks attached; and

an underframe connected to the box-like structure comprising two substantially straight fork-shaped girders arranged symmetrically with respect to the longitudinal axis of the vehicle, said fork-shaped girders being arranged with an inclination towards the central longitudinal axis of the vehicle so that the outer prongs of the fork-shaped girders that face the outside of the vehicle are each connected to a separate vertical corner column on a level with the bumper and the inner prongs of the fork-shaped girders that face the center of the vehicle are connected to the base frame below the point where the outer prongs are connected to the vertical columns, the struts of the fork-shaped girders being connected to the bumper shanks and a traverse means of said base frame connecting the outer and inner prongs of each fork-shaped girder.

3,971,589

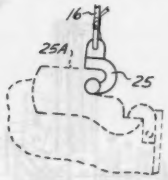
RETRACTABLE AUTOMOBILE TRUNK LID TIE DOWN

Donald L. Elrod, 1801 Butler Road, Willis, Mich. 48191

Filed Feb. 19, 1974, Ser. No. 443,254

Int. Cl.² B62D 25/10

U.S. Cl. 296—76 6 Claims



1. The combination with a vehicle, having a trunk, a hinged lid, and an electric release trunk locking mechanism, of a tie down cable retractably secured to a spring biased, rachet controlled, rotatable member, with a support element for said rotatable member secured to the underside of said lid, said cable having at it's free end an anchor element suitable for attachment to an element of said trunk locking mechanism, the anchor element comprises an anchor hook having an enlarged terminal end to be recieved in a recess formed in the latch element of said electric release trunk lock mechanism.

3,971,590

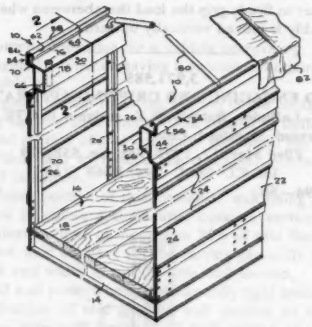
TRAILER TOP RAIL SYSTEM

James Raymon Yglesias, Savannah, Ga., assignor to Great Dane Trailers, Inc., Savannah, Ga.

Filed Oct. 11, 1974, Ser. No. 514,751

Int. Cl.² B62D 25/06

U.S. Cl. 296—104 21 Claims



1. A two piece top rail assembly for interchangeable use in constructing both open top trailers with exterior posts and exterior skin having corrugations comprising:

an elongated outside element having in cross section a depending first leg for securing to said trailer,

a second leg secured at an angle to said first leg,

a third leg secured to said second leg and having at least a portion extending substantially in the opposite direction to said first leg,

a fourth leg secured to said third leg and extending at an angle substantially in the direction toward said first leg, said fourth leg having a transverse length greater than the transverse length of said second leg by the extent of the protrusion of the corrugation on said skin,

a fifth leg secured to said fourth leg and extending substantially in the opposite direction to said first leg,

an inside element secured to said outside element for extending toward the inside of said trailer and having first and second transverse legs,

a connector leg extending between and connecting said first and second transverse legs, means within said first and second transverse legs for receiving a roof bow,

whereby said inside and outside elements form a two piece rail assembly to form an open top trailer having either an exterior post or exterior skin.

3,971,591

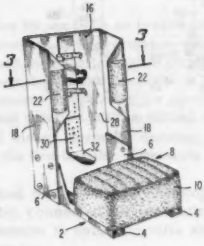
QUIC-SEAT

John Ziaylek, Yardley, Pa., assignor to Ziamatic Corporation, Yardley, Pa.

Filed May 1, 1975, Ser. No. 573,694

Int. Cl.² A47C 7/62

U.S. Cl. 297—191 **5 Claims**



1. A seat for use in emergency vehicles comprising a lower seat portion and a back rest portion extending upwardly above said seat portion, said back rest portion having a cavity therein provided with side walls and an opening facing toward the front of the seat portion through which an oxygen tank or the like may be readily moved into and out of the cavity, said back rest portion further having spaced laterally projecting extensions mounted on said side walls and located on opposite sides of said forwardly facing opening in position to serve as forwardly facing back support surfaces for a person seated on said seat portion and having an oxygen tank or the like mounted on his back.

3,971,592

CHAIR FOR AIDING CONJUGAL RELATIONS FOR THE INFIRM

Brent Farley, 4215 Connecticut Ave., Baltimore, Md. 21229

Filed Sept. 26, 1974, Ser. No. 509,643

Int. Cl.² A47C 7/62

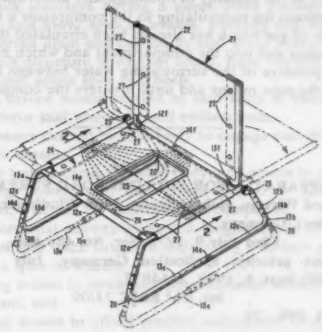
U.S. Cl. 297—217 **10 Claims**

1. A chair for aiding conjugal relations for the infirm comprising:

a frame having a front member, a back member and two side members, said front and back members being adjustable to expand the width of the chair,

legs attached to the frame at the corners and to each other to form a contact surface greater than the depth of the seat, and

a covering spread between the front, sides and back members and surrounding portions of said members and having an orifice in the region of the center of the covering.



3,971,593

METHOD OF EXTRACTION OF NODULAR SEDIMENTS OR THE LIKE FROM THE SEA FLOOR AND AN INSTALLATION FOR CARRYING

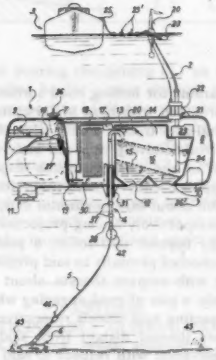
Robert Porte, Le Mesnil-St. Denis, and Michel Rommens, Chevreuse, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed July 9, 1974, Ser. No. 486,877

Claims priority, application France, July 18, 1973, 73.26289

Int. Cl.² E02F 3/88, 7/00

U.S. Cl. 299—8 **11 Claims**



1. An underwater station for collecting ore particles of a predetermined minimum size from sea beds, comprising a compartment adapted to be submerged and having a portion open to the sea for maintaining the compartment at the same pressure as the surrounding water, separating means for retaining in the compartment particles above the predetermined minimum size and returning to the sea particles below the predetermined minimum size, pipe means for supplying ore particles to the separating means, the pipe means including suction means for creating a lifting force so that a combination of ore particles and sea water are lifted from the sea bed into the compartment, the suction means including a plurality of openings in the pipe means through which gas under pressure

can be injected for providing the lifting force, the suction means further including a compressor for supplying gas under pressure to the plurality of openings, and underwater recirculation means for recirculating to the compressor a substantial quantity of gas which has already been circulated through the pipe means and into the compartment and which is subjected to the pressure of the surrounding water between the time it leaves the pipe means and until it enters the compressor.

3,971,594

APPARATUS FOR MILLING ROAD SURFACES

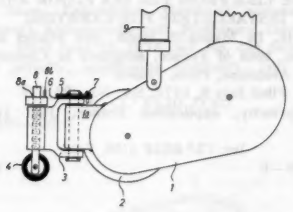
Reinhard Wirtgen, Hohaerstrasse, 5461 Windhagen uber Linz (Rhine), Germany

Filed July 9, 1974, Ser. No. 486,860

Claims priority, application Germany, July 10, 1973, 2335002; Sept. 6, 1973, 2344877

Int. Cl.[2] E01C *23/09*

U.S. Cl. 299—39 **4 Claims**



1. In an apparatus for milling road surfaces, an elongated milling roller provided with hard metal cutters and having a central horizontal axis around which said roller is adapted to be driven, said roller having opposed ends extending across said axis, a pair of end support means respectively situated next to said opposed ends of said roller for supporting the latter for rotation about said horizontal axis, said pair of end support means respectively having projections both of which extend forwardly beyond said roller, a pair of swivel arms respectively connected pivotally to said projections for swivelling movement with respect thereto about parallel vertical axes, respectively, a pair of road-engaging wheels, and adjusting means connecting said wheels respectively to said swivel arms at portions thereof distant from said projections for adjustment in elevation with respect to said swivel arms and for orientation in a direction where the axis of each wheel is parallel to the axis of said roller irrespective of the angular position of each swivel arm with respect to the projection to which it is pivotally connected, said swivel arms cooperating with said projections for situating said wheels in a selected one of three positions, namely positions respectively situated in front of said projections, positions respectively situated between said projections and in front of said roller, and positions respectively situated laterally beyond said projections outside of the space therebetween, and a pair of lock means, one of said lock means cooperating with swivel arms for locking the latter in a selected one of said positions and the other of said lock means cooperating with said adjusting means for locking said wheels in a position oriented with their axes parallel to the axis of said milling roller.

3,971,595

ANTI-SKID BRAKE CONTROL SYSTEM

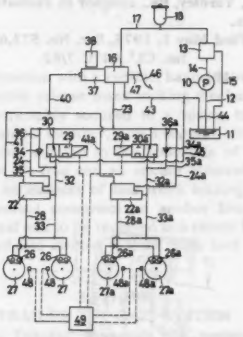
Toshiyuki Kondo, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Aug. 26, 1975, Ser. No. 607,786

Claims priority, application Japan, Aug. 26, 1974, 49-97060

Int. Cl.[2] B60T *8/06*

U.S. Cl. 303—21 F **3 Claims**



1. An anti-skid brake control system comprising:

a source of fluid pressure;

front and rear wheel brake means;

brake booster means fluidically connected to said source of fluid pressure for generating power pressure;

master cylinder means operatively connected to said brake booster means for supplying fluid pressure to said front and rear wheel brake means in accordance with the actuation of said brake booster means;

control valve means interposed between one of said front wheel brake means and said brake booster means and between one of said rear wheel brake means and said brake booster means for supplying said power pressure of said brake booster means to said front and rear wheel brake means and for decreasing said power pressure supplied to said front and rear wheel brake means according to a skid condition of said front and rear wheel brake means; and

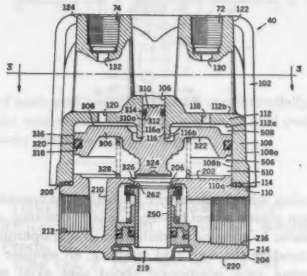
actuator means interposed between the other one of said front wheel brake means and said master cylinder means and between the other one of said rear wheel brake means and said master cylinder means for supplying fluid pressure to said other ones of said front and rear wheel brake means in accordance with the actuation of said master cylinder,

whereby said anti-skid control system supplies said power pressure of said brake booster means to said actuator means for actuating said actuator means in order to supply said fluid pressure from said master cylinder means to said front and rear wheel brake means under normal braking operations and for blocking said fluid pressure from said master cylinder means to said front and rear wheel brake means under skid conditions.

3,971,596
ELECTRO-PNEUMATIC AIR BRAKE VALVE AND SYSTEM COMPATIBLE WITH A SKID CONTROL SYSTEM

Arthur R. Grix, St. Louis, Mo., assignor to Wagner Electric Corporation, Parsippany, N.J.

Division of Ser. No. 536,596, Dec. 26, 1974. This application June 27, 1975, Ser. No. 591,148
Int. Cl.² B60T *13/68*
U.S. Cl. 303—40 **5 Claims**

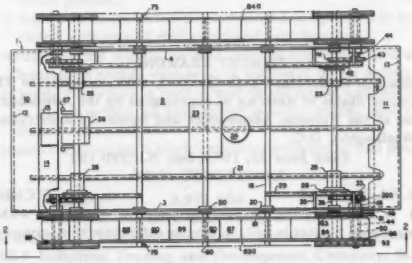


1. A relay valve for use in an air brake system wherein brake actuators are operated by fluid pressure, the valve comprising:
- first port means in the valve for receiving a first impulse of fluid pressure from a first source;
- second port means in the valve for receiving a second impulse of fluid pressure from a second source;
- first solenoid means normally opening the first port for permitting the first impulse of pressure to enter the valve; and
- second solenoid means normally closing the second port and operably connected for permitting the second impulse of pressure to enter the valve simultaneously with the first impulse.

3,971,597
ALL TERRAIN VEHICLE

Harold R. Wright, 18950 Woodward Ave., Detroit, Mich. 48203

Filed Mar. 26, 1975, Ser. No. 562,355
Int. Cl.² B62D *35/30*
U.S. Cl. 305—10 **23 Claims**

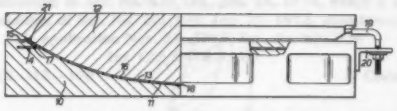


1. A vehicle to traverse a surface, said vehicle comprising a hollow body having opposite sidewalls, and have a front end and a rear end,
- a track structure extending rigidly, longitudinally of said body,
- a plurality of wheels sequentially disposed to travel longitudinally about said track structure in an endless path,
- said wheels including an upper span traveling above said track structure, and a lower span traveling beneath said track structure, to engage a surface being traversed,
- said track structure having a lower, fixed runway resting upon said lower span of wheels, whereby said vehicle is supported upon and carried by said lower span,
- said track structure having an upper, fixed runway to support said upper span of wheels,
- endless driven means carried by said body to interengage and drive said wheels in said endless path,
- drive means carried by said body to engage and drive said driven means,
- a power source carried by said body, and means to transmit driving power from said power source to said drive means, wherein the improvement comprises,
- a supplemental runway elongated longitudinally in a position of said track structure and having a surface engaged with a span of wheels,
- retaining means to retain said supplemental runway in said position, and
- adjusting means to afford positive adjustment of said supplemental runway toward and away from said track structure to compensate for slack in said endless drive means.

3,971,598
STRUCTURAL BEARINGS

Sydney James Rudge, Greenford, England, assignor to The Glacier Metal Company Limited, Alperton, Wembley, England

Filed Apr. 4, 1974, Ser. No. 457,892
Claims priority, application United Kingdom, Apr. 4, 1973, 16009/73
Int. Cl.² F16C *17/00*
U.S. Cl. 308—3 R **9 Claims**



1. A structure bearing comprising (1) an upper member, (2) a base member having a part sherical upwardly facing bearing surface supporting said upper member, there being a groove formed in said base member near the top and extending from said part spherical bearing surface substantially horizontally into said base member, and (3) a bearing layer supported on said bearing surface and fixed in position by having its edges engaged in said groove, said bearing layer engaging the upper member in such a manner as to permit universal freedom of angular movement of said upper member relative to the base member.

3,971,599
RECTILINEARLY GUIDING DEVICE

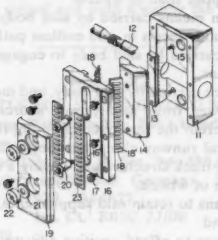
Megumu Shio, Kanagawa, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Jan. 21, 1975, Ser. No. 542,704
Claims priority, application Japan, Jan. 31, 1974, 49-12175
Int. Cl.² F16C *29/04*
U.S. Cl. 308—3 A **14 Claims**

1. A device for rectilinearly guiding a stage for carrying thereon a sample, comprising:
- a. a stationary member;
- b. a stationary race integrally formed with said stationary member and having at least two surfaces forming a certain angle with each other;
- c. a movable race movable with said stage in a predetermined direction with respect to said stationary member and having at least two surfaces opposed to said surfaces of said stationary race, respectively;

d. means for driving said movable race;

e. stage-moving sliders comprising a plurality of roll bearings and base plates supporting said bearings, said sliders being disposed between said opposed surfaces of said stationary race and said stage-moving movable race; and



f. resilient pressing means for causing said opposed surfaces of said stationary race and said movable race to impart pressure forces to said roll bearings simultaneously.

3,971,600

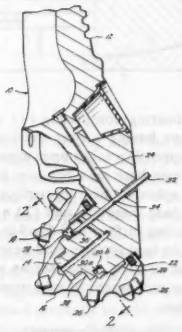
DRILL BIT

Henry W. Murdoch, and Percy W. Schumacher, Jr., both of Houston, Tex., assignors to Reed Tool Company, Houston, Tex.

Filed July 28, 1975, Ser. No. 599,817

Int. Cl.² F16C *33/66*

U.S. Cl. 308—8.2 **11 Claims**



1. A drill bit, comprising

a body having a shaft extending therefrom,

a roller cutter having a hollow central portion,

bearing means for rotatively mounting said roller cutter on said shaft with the outer edge of said roller cutter being in close spaced relationship to the base of said shaft,

an annular thrust bearing secured within said cutter,

means on said shaft for retaining said thrust bearing and said cutter in rotating position around said shaft,

a lubrication system defined in said body and said shaft and communicating with said bearing means and said thrust bearing, and

means sealing between the outer edge of said roller cutter and the base of said shaft whereby said bearing means and said annular thrust bearing and said retaining means are contained within the lubricated space between said roller cutter and said shaft.

3,971,601

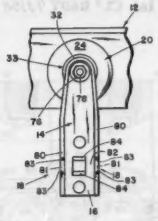
SANITARY ANTI-FRICTION TROLLEY WHEEL

Frederick R. Sytsma, Grand Rapids, Mich., assignor to C. L. Frost & Son, Inc., Grand Rapids, Mich.

Filed Dec. 2, 1974, Ser. No. 528,794

Int. Cl.² B65G *17/20*; F16C *13/06, 19/16, 25/06*

U.S. Cl. 308—16 **18 Claims**



1. A trolley wheel assembly comprising, in combination: an anti-friction plastic wheel having a central opening; an annular outer metallic bearing race positioned in said opening; an axial means extending through said opening; an annular inner metallic bearing race positioned about said axial means and spaced from said outer race; and a plurality of anti-friction means disposed in said space defined between said races; said axial means including a shaft having an enlarged head portion, said head portion having a formed surface comprising at least a part of said inner race; said inner race further including a second member, said second member being cylindrical and adapted to fit over said shaft and into abutment with said enlarged head portion of said shaft, the outer surface of said second member comprising at least a portion of said inner race.

11. A trolley bracket assembly comprising, in combination: a trolley bracket having a trolley wheel supporting end, said end having an opening for receiving a trolley wheel; a trolley wheel comprising an anti-friction plastic wheel with a central opening; a pair of metallic annular outer bearing races in said central opening, said races being spaced axially apart; a set of roller balls for each of said races; an inner race assembly including a mounting shaft having an enlarged head on one end, the opposite end of said shaft adapted for insertion into said bracket opening for securing said trolley wheel to said bracket, said enlarged head including an inner race for one of said set of balls; and a cylindrical member adapted to fit over said shaft into abutment with said enlarged head, said cylindrical member including an inner race for the other of said set of balls.

3,971,602

THRUST BEARING

William J. Anderson, North Olmsted, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed June 25, 1975, Ser. No. 590,182

Int. Cl.² F16C *17/06*

U.S. Cl. 308—160 **7 Claims**

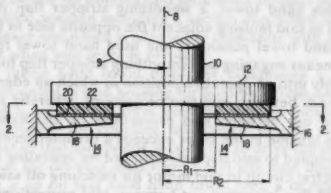
1. A thrust bearing assembly arranged to cooperate with a rotor which rotates in at least one angular direction, comprising,

a mount in annular form,

spokes cantilevered radially inward from said annular form, the cantilevered spokes being arranged at equal angular intervals about the axis of said mount and the coincident axes of said rotor,

a heat resistant annulus resilient relative to and supported by said cantilevered spokes against axial thrust, thereby forming flexible beams between adjacent pairs of said cantilevered spokes, and

thrust pads supported on said resilient beams to receive the thrust of said bearing, said pads being also spaced at like equal intervals angularly between said spoke, the leading



edge of each pad being farther circumferentially from its adjacent spoke than the lagging edge of said pad circumferentially from its adjacent spoke.

3,971,603

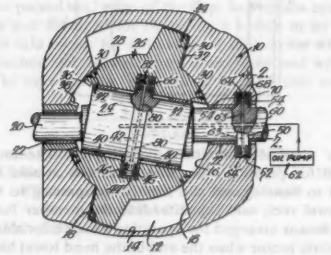
THRUST BEARING LUBRICATION

Roger Odell Bjerk, Edelstein, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 2, 1975, Ser. No. 618,985

Int. Cl.[2] F16C *1/24*

U.S. Cl. 308—168 **11 Claims**



1. A slant axis rotary mechanism comprising:
a housing defining a chamber including an operating cavity;
a shaft journalled in said housing and including an angularly offset portion within said chamber;
a rotor within said chamber and journalled on said angularly offset portion;
at least one thrust collar on said shaft and operatively associated with one of said rotor and said housing;
thrust bearing means on said one of said rotor and said housing in sliding engagement with said thrust collar;
at least one lubricant port in said thrust collar and opening to the interface of said thrust bearing means and said thrust collar; and
means for directing a lubricant under pressure to said port.

3,971,604

BOX BEARING

Jan Hendrikus Kapaan, Ijsselstein, Netherlands, assignor to SKF Industrial Trading and Development Company, B.V., Jutphaas, Netherlands

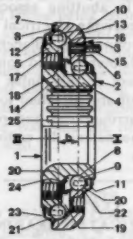
Filed Nov. 18, 1974, Ser. No. 524,491

Claims priority, application Netherlands, Dec. 10, 1973, 7316847

Int. Cl.[2] F16C *19/00, 21/00, 33/00*

U.S. Cl. 308—183 **19 Claims**

1. A roller bearing for a rotary element comprising a pair of bearing rings having substantially L-shaped axial cross-section portions with an annular running surface adjacent each end of the L-shaped cross-sections, each L-shaped cross-section portion having a radially extending portion, said rings opposing each other to form a substantially box-shaped bearing, first and second groups of a plurality of rolling elements, said rings being arranged to define, between their respective running surfaces, first and second bearing races of first and second diameters respectively, with said first bearing race having a greater diameter than said second bearing race, said first and



second groups of rolling elements being arranged in said first and second races respectively, a bearing cage for each of said groups of rolling elements, and axially extending fastening means on said radially extending portion of at least one ring between said first and second races for affixing said one ring in the axial direction to said rotary element, whereby said first and second groups of rolling elements form first and second rows respectively.

3,971,605

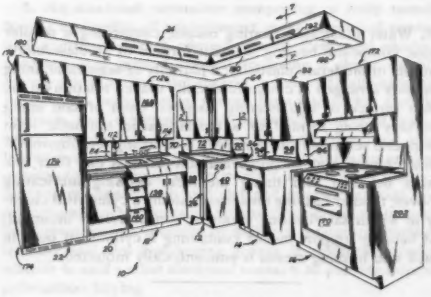
MODULAR FURNISHINGS

Russell M. Sasnett, Altamonte Springs, Fla., assignor to Russel M. Sasnett, Louisville, Ky.

Continuation of Ser. No. 435,758, Jan. 23, 1974, which is a continuation of Ser. No. 221,190, Jan. 27, 1972, abandoned. This application Nov. 28, 1975, Ser. No. 636,026

Int. Cl.[2] A47B *53/00*

U.S. Cl. 312—198 **1 Claim**



1. A modular furnishing assembly comprising a corner module and at least two additional modules laterally and transversely connected adjacent thereto, respectively, each of said modules being free-standing and having: (1) a base cabinet portion including parallel side walls and a counter top; (2) storage means having a top, a bottom, side walls coplanar with the side walls of said base cabinet, and doors providing access thereto, said storage means being integral with said base cabinet portion through column means and panel structure so that no portion of the kitchen wall behind a module is exposed, said integral column means providing support independently for each module and said storage means further being located above and rearwardly offset from said base portion to define a raceway extending upwardly substantially above the counter top of said base cabinet portion to provide for electrical wiring and plumbing is to be installed behind said module, said rearward offset also providing that said doors of said storage

means do not swing outwardly beyond the front plane of said module, said module being further characterized by at least one of said column means being spaced inwardly from the common plane of the side walls of the adjacent storage means and base cabinet portion, thereby defining, in conjunction with said counter top of said base portion and said bottom of said storage means, an inset bounded on three sides only and opening on the fourth side for cooperation with a like inset of any adjacent module in abutting association therewith to provide a tunnel for receiving electrical distribution means; connector means for connecting adjacent modules together along abutting side walls thereof, said connector means being accessible from the front of said units; and lighting means located above the top of and attached to said storage means for illuminating the surroundings and providing a molding between said storage means and the ceiling when the module is installed in the room.

3,971,606

WATER LUBRICATED BEARING DEVICE

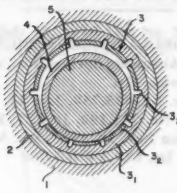
Yoshiki Nakano; Heiichiro Nakamura; Tatsuo Fujita, all of Yokohama; Kanichi Nakamura, and Masaaki Higo, both of Tokyo, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 21, 1974, Ser. No. 472,043

Claims priority, application Japan, Jan. 18, 1974, 49-8250

Int. Cl.² F16C *27/02, 33/20*

U.S. Cl. 308—238 **6 Claims**



1. Water lubricated bearing means, comprising a tubular elastic composite bearing member formed of an elastomeric material of moderate elasticity; a plurality of segmental lining members arranged in circumferentially spaced relation on the inside surface of said bearing member, each of said lining members being formed of a thermoplastic synthetic resin compound selected from the group comprising tetrafluoroethylene, polyethylene or polyacetal and at least one filler, the spaces between said lining members defining lubricating grooves; tubular bushing means containing a cylindrical chamber in which said bearing means is concentrically mounted; and bearing support means containing a cylindrical bore in which said bushing means is concentrically mounted.

3,971,607

FABRIC HAND TOWEL DISPENSER

Conrad W. Schnyder, Triesenberg, Liechtenstein, assignor to Neuco Apparatebau AG, Zug, Switzerland

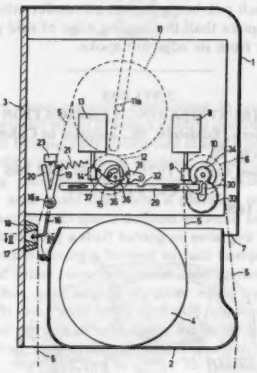
Filed Oct. 24, 1974, Ser. No. 517,585

Claims priority, application Switzerland, Oct. 29, 1973, 15177/73

Int. Cl.² B65H *19/00*

U.S. Cl. 312—38 **6 Claims**

1. A fabric hand towel dispenser comprising a housing; means mounted in said housing for holding a fresh hand towel reel and a used hand towel reel; an electric motor in said housing; means for coupling said motor to said used hand towel reel so that said motor is operable to drive the used hand towel reel for drawing used hand towel into said housing and winding it up on said used hand towel reel; a device for deflecting and thereby tensioning and smoothing the hand towel passing to the used hand towel reel, said deflecting device including two elongated straight projections mounted in said housing adjacent one side to the path of the hand towel passing to the used hand towel reel and extending transversely across this hand towel, a smoothing stripper flap pivotally mounted in said housing adjacent the opposite side of the path of the hand towel passing to the used hand towel reel, and biasing means engaging said smoothing stripper flap for urging it yieldably into an operative position in which an edge of said flap extends between said two projections, whereby said flap is pushed out between said projections by the hand towel when the tension in the latter exceeds a predetermined value; means coupled to said flap and arranged for operating a switch in an electric circuit to said motor for switching off said motor when said flap is pushed out between said projections; and a



separate detector member including a detector finger mounted for pivoting about the same axis as said flap and adapted to bear against the hand towel passing to the used hand towel reel, said separate detector member further including means arranged for operating a switch for shutting off said electric motor when the end of the hand towel has passed said detector finger.

4. A fabric hand towel dispenser comprising a housing; means mounted in said housing for holding a fresh hand towel reel and a used hand towel reel; an electric motor in said housing; means for coupling said motor to said used hand towel reel so that said motor is operable to drive the used hand towel reel for drawing used hand towel into said housing and winding it up on said used hand towel reel; a device for deflecting and thereby tensioning and smoothing the hand towel passing to the used hand towel reel, said deflecting device including two elongated straight projections mounted in said housing adjacent one side of the path of the hand towel passing to the used hand towel reel and extending transversely across this hand towel, a smoothing stripper member movably mounted in said housing adjacent the opposite side of the path of the hand towel passing to the used hand towel reel, and biasing means engaging said smoothing stripper member for urging it yieldably into an operative position in which an edge of said smoothing stripper member extends between said two projections, whereby said member is pushed out between said projections by the hand towel when the tension in the latter exceeds a predetermined value; means coupled to said smoothing stripper member and arranged for operating a switch in an electric circuit to said motor for switching off said motor when said member is pushed out between said projections; and devices for retracting said smoothing stripper member against the action of said biasing means and for holding said member in a retracted position during the dispensing of hand towel, said retracting devices including a lever which is adapted to be pivoted when a pull is exerted on the hand towel passing from the fresh hand towel reel out of the housing, said

lever being coupled to said smoothing stripper member through a mechanical connection which includes a draw member which is tensioned and retracts said smoothing stripper member when said lever is pivoted by pull on the hand towel, and said device for holding said smoothing stripper member in its retracted position including a suction cup which is secured to said lever and which is adapted to cooperate with a counter element when said lever is pivoted.

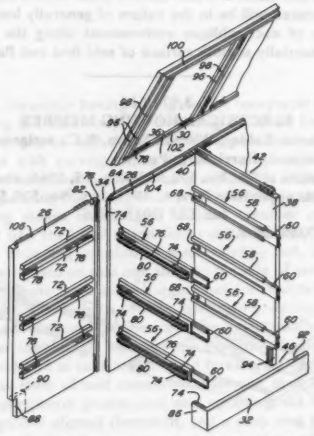
5. A fabric hand towel dispenser comprising a housing; means mounted in said housing for holding a fresh hand towel reel and a used hand towel reel; an electric motor in said housing; means for coupling said motor to said used hand towel reel so that said motor is operable to drive the used hand towel reel for drawing used hand towel into said housing and winding it up on said used hand towel reel; a device for deflecting and thereby tensioning and smoothing the hand towel passing to the used hand towel reel, said deflecting device including two elongated straight projections mounted in said housing adjacent one side of the path of the hand towel passing to the used hand towel reel and extending transversely across this hand towel, a smoothing stripper flap pivotally mounted in said housing adjacent the opposite side of the path of the hand towel passing to the used hand towel reel, and biasing means engaging said smoothing stripper flap for urging it yieldably into an operative position in which an edge of said flap extends between said two projections, whereby said flap is pushed out between said projections by the hand towel when the tension in the latter exceeds a predetermined value, and is pushed in between the projections beyond said operative position by said biasing means when the end of the hand towel has passed said edge of the flap; and means coupled to said flap and arranged for operating a switch in an electric circuit to said motor for switching off said motor when said flap is pushed out between said projections and when it is pushed in between the projections beyond said operative position.

3,971,608

KNOCK-DOWN DRAWER UNIT

Charles C. Gans, 240 E. 35th St., New York, N.Y. 10016

Filed Apr. 17, 1975, Ser. No. 568,968
Int. Cl.² A47B *43/00*
U.S. Cl. 312—257 R **8 Claims**



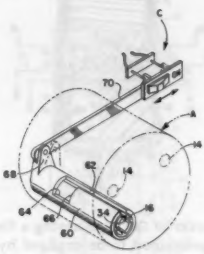
1. A knock-down drawer unit comprising at least one drawer, a frame for supporting said drawer therein, said frame comprising a vertical side wall and a top wall, said side wall including mounting means having a support bar permanently secured to said side wall, a flange, and a slide assembly permanently connected to said flange and supported on said support bar, said slide assembly slidably supporting said drawer in said frame and comprising an elongated channel member and an elongated slide disposed in said channel member, said flange being disposed on said support bar and releasably secured thereto by a two component releasable fastening tape, one component thereof having a plurality of hook-like elements thereon and the other component thereof having a plurality of loop-like elements thereon, one of said components being permanently secured to said support bar and the other component being permanently secured to said flange, said side wall and top wall of said frame being connected to each other by a freely detachable joint, said joint being secured together by a two component releasable fastening tape, one component thereof having a plurality of hook-like elements thereon and the other component thereof having a plurality of loop-like elements thereon, one of said components being permanently secured to said side wall and the other being permanently secured to said top wall.

3,971,609

ELECTRICAL CONNECTORS

George W. Knecht, Brooklyn, N.Y., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Dec. 6, 1974, Ser. No. 530,061
Int. Cl.² H01R *3/06*
U.S. Cl. 339—14 P **12 Claims**



1. An electrical connector comprising; a body member having a plurality of spaced-apart socket electrical contacts and a ground socket contact spaced from said electrical contacts, said ground contact including a sleeve member having a longitudinal slot therein, a longitudinally-extending bore in said body member spaced from said socket electrical contacts and substantially coincidental with said ground socket contact, an insert secured in said bore, said insert having a centrally located hole therein defining an entrance opening to said ground socket contact, and a keying groove in said insert aligned with said slot and intersecting said hole, said ground socket contact and insert being securable in said body member in a plurality of different rotated positions for locating said slot and keying groove in different locations relative to said socket electrical contacts to provide selective polarization keying.

3,971,610

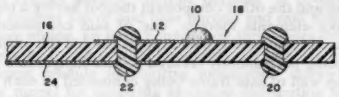
CONDUCTIVE ELASTOMERIC CONTACTS AND CONNECTORS

Leonard S. Buchoff, Bloomfield; Joseph P. Kosiarski, Englishtown, and Chris A. Dalamangas, Fort Lee, all of N.J., assignors to Technical Wire Products, Inc., Cranford, N.J.

Filed May 10, 1974, Ser. No. 468,652
Int. Cl.² H05K *1/04*
U.S. Cl. 339—17 R **9 Claims**

1. A circuit board carrying at least two conductors on a portion of one side of said board, said at least two conductors being electrically insulated from each other, each conductor having an electrically conductive elastomeric contact integrally fixed thereto, and actuator means positioned in physical proximity to at least two of said elastomeric contacts, the actuator means having a conductive surface for completing

the electrical circuit between said at least two elastomeric contacts, at least one of said elastomeric contacts extending from the surface of said circuit board to said actuator means



for preventing the conductive surface of said actuator means from contacting another elastomeric contact on said board without the application of an externally applied force.

3,971,611

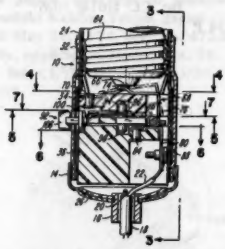
SAFETY SOCKET FOR LAMPS AND THE LIKE

Manning I. Rose, 2301 Glenheath, Dayton, Ohio 45440

Filed Oct. 10, 1974, Ser. No. 513,632

Int. Cl.² H01R *13/44, 33/30*

U.S. Cl. 339—34 **10 Claims**



1. In a safety socket of the type having a first contact and a second contact positioned to be engaged by a load device that is inserted and removed by movement along a predetermined axis extending through the socket, the improvement wherein said socket further includes a contact terminal separate from said second contact which is engaged by said second contact when said socket is operative, an insulator member supported in said socket for movement relative to both said contact terminal and said second contact, and means for moving said insulator member to a position wherein it is interposed between said terminal and said second contact in response to removal of a load device from said socket thereby to prevent engagement between said second contact and said terminal, said insulator member being movable from said position in a path other than parallel to the said axis and not movable by force applied thereto in a direction parallel to said axis so that a force must be applied to said insulator member in a direction other than parallel to said axis to permit reengagement between said second contact and said terminal after a load device has been removed.

3,971,612

FLIP-TOP CARTON OF TRUNK TYPE FOR FROZEN ICE CREAM AND COMESTIBLES OF SIMILAR CONSISTENCY

Raymond C. Koenig, Wheaton, Ill., assignor to Champion International Corporation, Stamford, Conn.

Filed Sept. 22, 1975, Ser. No. 615,728

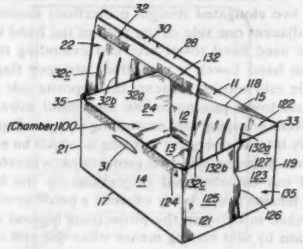
Int. Cl.² B65D *5/02, 17/12*

U.S. Cl. 229—37 R **5 Claims**

1. A trunk type carton formed from a one piece blank of coated paperboard, and the like, and having a flip-top panel for access to highly viscous or stiffly frozen comestible content hingedly connected along a lateral fold line to a back panel, with the latter, a bottom panel and a front panel hingedly connected successively together by similar lateral fold lines; the end edges of said flip-top panel and the two ends of each of said back, bottom and front panels being provided with end flaps hinged thereto by fold lines and hingedly stackable at each end to form a container having closed ends,

1. said bottom panel having each of its end flaps swung upwardly as the first end flap in each end stack with its outermost face being a substantially smooth surface and with the folded end flaps of said back and front panels in each end stack lapped in against each other over the outer face of said upfolded first end flap as the third and fourth end flaps in each stack and with the latter end flaps anchored together;

2. said flip-top panel being swung down to closure of the top of said carton with its end flaps swung inward to general alignment with said bottom panel end flaps as the second end flap in each end stack and slidably inserted by swing



between said first end flap and said third and fourth anchored end flaps of this end stack, each of said flip-top panel second end flaps having its free edge opposite its hinged fold line so dimensioned and shaped as to permit such swinging insertion freely;

3. each of said second end flaps also having its inner side face which is opposed to the outer side face of said first end flap in each end stack provided with a plurality of lines of embossments spaced appreciably transversely from each other and extending obliquely in generally parallel relation thereacross from the general vicinity of the hinge fold line connection of this second flap to the adjacent end of said flip-top panel, whereby swing out of each end stack in which each of these second end flaps is associated will be in the nature of generally longitudinal glide of each oblique embossment along the opposed substantially smooth surface of said first end flap.

3,971,613

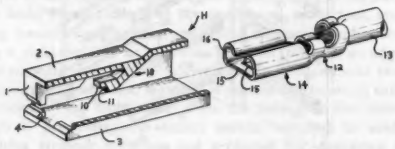
ELECTRICAL HOUSING MEMBER

Robert James Kobler, Winston-Salem, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 572,589, Aug. 15, 1966, abandoned. This application Nov. 4, 1974, Ser. No. 520,572

Int. Cl.² H01R *9/16*

U.S. Cl. 339—59 R **2 Claims**



1. In an insulated clip structure to be used in electrical connections, the combination comprising a sheath of resilient plastic insulating material defining a clip receiving cavity, a clip member which is essentially rigid as related to said sheath, said clip member being provided with a shoulder intermediate the ends thereof, said sheath being open at both ends, the front end of said sheath being provided with a flange serving

as a stop for the corresponding end of said clip, said sheath further including a pair of oppositely disposed walls, one of said walls being provided with an internal catch member in the form of a wedge, and at least one of said walls being elongated in transverse section and so sized and shaped as to enable it to yield elastically in a transverse direction thereby to cause said opposite walls to be temporarily forced apart in a transverse direction as said clip following insertion into said sheath from the rear end engages and moves along said wedge, the front end of said wedge establishing a shoulder which is forced to position itself behind and engage said intermediate shoulder of said clip as said clip shoulder passes by said wedge shoulder and said elastically yieldable wall moves back toward said other wall, said engaged shoulders of said sheath and clip together with an engagement between the front end of said clip and said stop flange serving to prevent said clip from any longitudinal movement in either direction within said sheath.

3,971,614

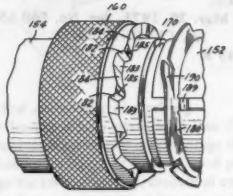
ELECTRICAL CONNECTOR WITH MEANS FOR MAINTAINING A CONNECTED CONDITION

Alfred Paoli, and Bipin J. Shah, both of Chicago, Ill., assignors to Akzona Incorporated, Asheville, N.C.

Filed Nov. 3, 1972, Ser. No. 303,339

Int. Cl.² H01R 13/54

U.S. Cl. 339—89 R **5 Claims**



1. In a connector having a plug shell, a receptacle shell, and a coupling nut, said coupling nut being mounted for rotation relative to one of said shells and having threads adapted to cooperate with corresponding threads on the other of said shells, the combination comprising a plurality of projections extending axially outwardly from the end of said coupling nut, restraining means including a resilient member connected with said one shell and urged into contact with said projections for impeding rotation of said coupling nut, a retainer member mounted on said one shell on the side of said resilient member remote from said coupling nut for maintaining said resilient member in juxtaposition with said coupling nut, said coupling nut and said retainer member being axially movable relative to each other, whereby the position of said retainer member relative to said coupling nut furnishes a visual indication of the state of said connector, said one shell having an external peripheral groove and said coupling nut having an internal groove aligned therewith, and a snap ring partly disposed in each of said grooves to maintain said coupling nut in mounted relation to said one shell, said snap ring having an axial dimension less than the axial dimension of at least one of said grooves, whereby said coupling nut is shiftable on said one shell between a first position in which said snap ring engages one side of the groove on the coupling nut and the opposite side of the groove on said one shell, and a second position in which said snap ring engages the other side of the groove on the coupling nut and the opposite side of the groove on said one shell.

3,971,615

SERIES CONNECTOR

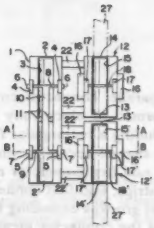
Syunichi Hashimoto, 36-24, Higashiryoke 2-chome, Kawaguchi, Saitama, Japan

Filed Apr. 3, 1975, Ser. No. 564,708

Claims priority, application Japan, July 30, 1974, 49-90112; June 11, 1974, 49-66950

Int. Cl.² H01R 9/08

U.S. Cl. 339—98 **2 Claims**



1. A series connector for electrically connecting the ends of a pair of wires, comprising a unitary main body formed of hard insulating synthetic resin and including:

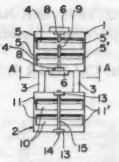
1. a rectangular lower body portion which has in one major surface thereof a longitudinal center groove of semicircular cross-section extending for a substantial distance along the length of said body portion and terminating short of the opposite ends of the latter to thereby form a pair of thin yieldable end walls; a first pair of opposed engaging projections extending uprightly from said major surface adjacent to one end of said body portion, each upright projection having a projection extending laterally and outwardly of the associated upright engaging projection; a second pair of engaging projections extending uprightly from said major surface adjacent to the other end of said body portion, each upright projection having a projection extending laterally and outwardly of the associate upright projection; said lower body portion having first and second transverse grooves extending between said first and second pairs of upright projections, respectively, and intersecting said longitudinal center groove at right angles thereto, a longitudinal recess formed in the bottom of said longitudinal center groove and extending between said first and second transverse grooves; and a pair of opposite engaging pieces formed on the opposite sides of said longitudinal recess midway between the opposite ends thereof;

3,971,616

ELECTRICAL PARALLEL CONNECTOR

Syunichi Hashimoto, 36-24, Higashiryoke, 2-chome, Kawaguchi Saitama, Japan

Filed May 8, 1975, Ser. No. 575,660
Claims priority, application Japan, June 11, 1974, 49-66951
Int. Cl.² H01R 13/38
U.S. Cl. 339—98 1 Claim



1. An electrical parallel connector comprising an integral unitary structure formed of electrically insulative hard synthetic resin and including a rectangular first connector member and a similarly-shaped second connector member integrally connected to said first connector member by means of flexible connecting strips, said first connector member having a plurality of parallel grooves extending for a substantial portion of the length of the connector member and terminating short of the opposite ends of the connector member to provide end walls which define the opposite ends of the grooves, one end wall of each of the grooves and the adjacent end of the associated connector member being spaced from each other by a distance greater than the distance between the other end wall of the groove and the adjacent end of the connector member to make the one end wall thicker than the other end wall, projections on the opposite sides of the associated connector member projecting outwardly of said major surface for fitting on the opposite sides of said second connector member, first recesses in the outermost side walls of said grooves extending across the side walls into the bottoms of the grooves and positioned adjacent to and inwardly of said projections and a second recess positioned between said first recesses and extending across the common inner side wall of said grooves into the bottoms of the adjacent grooves; and said second connector member having a corresponding number of parallel grooves extending by a substantial portion of the length of the connector member in one major surface thereof and terminating short of the opposite ends of the connector member to provide end walls which define the opposite ends of the grooves in the second connector member, one end wall of each of the grooves and the adjacent end of the connector member being spaced from each other by a distance greater than the distance between the other end wall of the groove and the adjacent end of the connector member to make the one end wall thicker than the other end wall, projections at the opposite side edges of the connector member projecting outwardly of said major surface of the second connector member for engaging in said first recesses in the first connector member and a recess extending between said projections of the second connector member across the bottoms of the grooves in the second connector member; further including a substantially W-shaped electrically conductive connecting blade having alternate prongs and pointed piercing projections received in said first and second recesses in the first connector member and the recess in the second connector member and covered wires received within the mating grooves in the first and second connector members and pierced by said pointed piercing projections.

3,971,617

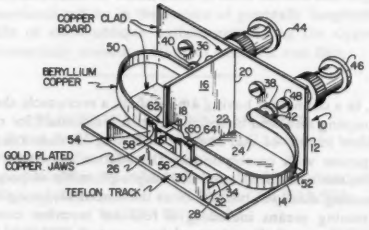
Patent Not Issued For This Number

3,971,618

HOLDING DEVICE FOR MEASURING THE CAPACITY OF SMALL ELECTRICAL COMPONENTS

Paul O. Prince, Kensington, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 20, 1975, Ser. No. 560,653
Int. Cl.² H01R 13/12
U.S. Cl. 339—143 R 7 Claims



1. A device for holding small electrical components comprising:

a. a combined support and electrostatic shield means;

b. first and second movable electrical contacts for holding an electrical component therebetween;

c. first and second electrically conductive output terminals supported by said support means;

d. first and second electrically conductive spring means for urging said electrical contacts into an abutting relationship to thereby hold said electrical component between said first and second electrical contacts, said first spring

means being connected to said first electrical contact and said first output terminal and said second spring means being connected to said second electrical contact and said second output terminal to thereby electrically connect said electrical component with said first and second output terminals;

e. a guide means including a Teflon track having a linear lip portion extending therefrom; securely attached to said support means for maintaining said electrical contacts along a linear path of travel; and

f. said combined support and shield means further comprises a planar electrostatic shield member interposed between said first and second spring means.

3,971,619

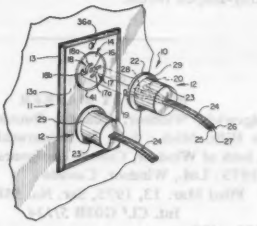
SAFE ELECTRICAL CONNECTOR

Donald J. Rohrssen, 511 Broadway, Rock Springs, Wyo. 82901

Continuation of Ser. No. 430,786, Jan. 4, 1974, abandoned. This application May 27, 1975, Ser. No. 580,951

Int. Cl.[2] H01R *33/46*

U.S. Cl. 339—189 R **8 Claims**



1. An electrical connector comprising

a receptacle having a face plate with one display face and a circuit face, at least one of set openings through the face plate, including an opening for a ground prong and a pair of openings for circuit prongs, electrical contact members offset from but adjacent to at least two openings of the set, said electrical contact members each having an inclined plane projecting outwardly from the circuit face and a detent projecting from the inclined plane whereby circuit prongs will pass over the detents to be securely held against the inclined planes of said contact members and to hold an electrical plug tightly against the display face, electrical connector terminals on the circuit face of the face plate, circuit means on the circuit face respectively interconnecting the electrical connector terminals with the electrical contact members; and

an electrical plug having a plurality of electrical prongs projecting from one face of said plug, a pair of said prongs constituting circuit prongs and each having an angled portion extending therefrom, said angled portions being in essentially the same plane, being shaped to fit through the slots of a set of openings through the face plate, and being arranged to engage the inclined planes of the electrical contact members when said prongs are inserted through the face plate and are turned past the detents.

3,971,620

TELESCOPE ASSEMBLIES

George Everett, Burlington, Unionville, Conn., assignor to Gros-ite Industries, Inc., Farmington, Conn.

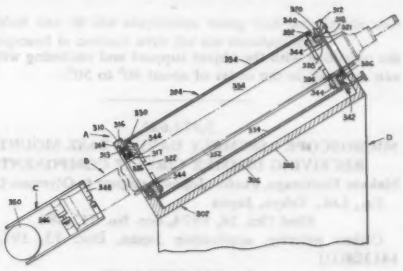
Filed May 16, 1974, Ser. No. 470,515

Int. Cl.[2] G02B *23/02, 21/24*

U.S. Cl. 350—26 **5 Claims**

1. Apparatus for use with a refracting astronomical telescope having an eyepiece end, an objective end, and an optical axis for forming an astronomical telescope assembly, the apparatus comprising:

a frame including a cradle for the attachment thereto of a refracting astronomical telescope for rotation about its optical axis only, the frame being adapted for mounting in a position in which said optical axis is parallel to the axis of the earth's rotation, and with the eyepiece end of the telescope higher than the objective end, the frame having first and second end walls spaced apart on a base and substantially perpendicular thereto and carrying first and second bearing means, the opposite ends of the cradle being rotatably supported by said bearing means for enabling the telescope to be rotated about its optical axis;



a reflector unit for attachment to the objective end of the telescope for rotation with the telescope, the reflector unit having a reflecting surface which intersects said optical axis, means for pivoting the reflecting surface about a second axis substantially perpendicular to said optical axis when the reflector unit is attached to the telescope for directing light into the objective end of the telescope; and

manually operable reflecting surface control means carried by the frame in a position adjacent the eyepiece end of the telescope for remote positioning of the reflecting surface about said second axis.

3,971,621

METHOD AND APPARATUS FOR GENERATING A RELIEF-LIKE CONTRAST AT MICROSCOPIC IMAGES OF A TRANSPARENT PHASE OBJECT

Gunter Albrecht-Buehler, Gainerville, Fla., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 27, 1974, Ser. No. 446,449

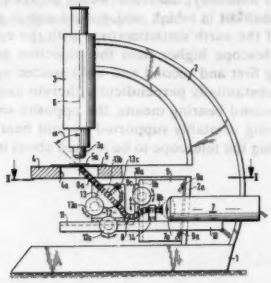
Claims priority, application Switzerland, Mar. 1, 1973, 3001/73

Int. Cl.[2] G02B *21/06*

U.S. Cl. 350—87 **6 Claims**

2. A microscope for producing a relief-like contrast at a microscope image of a transparent phase object, comprising a microscope objective possessing an optical axis, an object support, an object illumination device generating a mutually incoherent bundle of light rays for oblique illumination of the object, said object illumination device comprising a light source and a light conductor comprising a bundle of glass fibers, said bundle of glass fibers having a frayed end confront-

ing said light source and a light radiating end arranged at the direct region of the point of intersection of the optical axis of



the objective with the object support and enclosing with said axis an angle in the order of about 40° to 50°.

3,971,622

MICROSCOPE ASSEMBLY HAVING BASE MOUNT FOR RECEIVING DIMMER CIRCUIT COMPONENTS

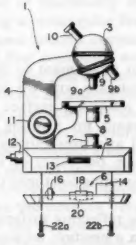
Makoto Yoshinaga, Fuchu, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 24, 1974, Ser. No. 517,486

Claims priority, application Japan, Dec. 13, 1973, 48-141328[U]

Int. Cl.² G02B 21/06

U.S. Cl. 350—87 2 Claims



1. A microscope assembly comprising:

lens barrel means;

a base for supporting said barrel means;

the underside of the base having a recess;

a tray-shaped component mounting member having a flat central portion and upwardly sloping sides defining a tray-shaped recess;

said mounting member having spaced openings for loosely receiving threaded fasteners;

said base being adapted to be positioned upon said mounting member whereby said recess and the top surface of said mounting member cooperatively define a hollow substantial rectangular shaped enclosed volume;

said base having openings aligned with the openings in said component mounting member and being threadedly engaged by said fasteners to secure said mounting member to the bottom of said base;

said interior volume being of a size sufficient to fully enclose all of the electrical elements typically incorporated in a dimmer circuit conventionally employed for adjusting the intensity of a light source employed as an illumination means in the microscope;

said base having a first opening along the exterior surface communicating with said recess;

a voltage adjusting knob extending at least partially through said opening for manually adjusting the voltage supplied to the light source;

a second opening being provided in said base and communicating with said recess;

a cable connector extending through said second opening and into said interior volume;

the upper surface of the center portion of said tray-shaped component mounting member being adapted to support at least some of the electrical components typically utilized in a dimmer circuit, said components including at least a transformer and a thyristor being mounted upon said center portion to thereby facilitate maintenance, repair, inspection, and/or replacement of said components when the component mounting member is separated from said base whereby said selected components are freely accessible from the top surface of the component mounting member;

the bottom surface of said component mounting member serving as the supporting surface of the microscope assembly when secured to said base;

said interior volume being the sum of said base recess and said tray-shaped recess.

3,971,623

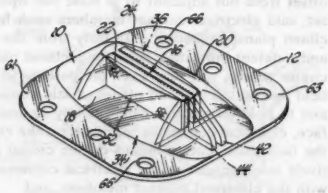
ROADWAY MARKER

Peter Hedgewick, Windsor, Canada; Donald C. Suhr, Farmington Hills, Mich.; John F. Domaracki, and Robin A. Arnott, both of Windsor, Canada, assignors to International Tools (1973) Ltd., Windsor, Canada

Filed Mar. 13, 1975, Ser. No. 558,181

Int. Cl.² G02B 5/124

U.S. Cl. 350—103 46 Claims



1. A pavement marker comprising: a thin walled, shell-like body of substantially uniform wall thickness with a chamber formed therein; said body being at least partially of transparent material to form a transparent outer wall for said chamber so that the interior of said chamber is visible through said transparent outer wall; and marker means located in said chamber so as to be visible through said transparent outer wall, said marker means being spaced from and out of contact with said transparent outer wall such that there is an air space between said marker means and transparent outer wall whereby light rays striking said transparent outer wall externally of said chamber pass through said transparent outer wall and said air space to strike said marker means.

3,971,624

CONTROLLABLE ELECTROCHROMIC INDICATOR DEVICE WITH IONIC CONDUCTING INTERMEDIATE LAYER AND NON-POLARIZABLE ELECTRODES

Peter Bruesch, Nussbaumen; Fritz Lehmann, Baden; Claus Schuler, Widen, and Hans-Rudolf Zeller, Birr, all of Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed May 6, 1975, Ser. No. 575,008

Claims priority, application Switzerland, June 12, 1974, 8011/74

Int. Cl.² G02B 5/23; G02F 1/36

U.S. Cl. 350—160 R 24 Claims

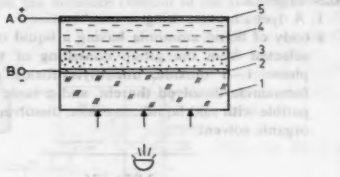
1. A controllable electrochomic indicator device comprising:

two electrodes,

an electrochromic layer and an adjacent charge-carrier-transmitting insulator layer situated between the two electrodes,

at least one of the electrodes being deposited on a supporting plate and at least one of the electrodes being transparent,

the charge carrier transmitting insulator layer being a good ion conductor and functioning to almost completely block the flow of electrons, and



at least one of the electrodes being non-polarizable and disposed in contact with the ion conductor.

3,971,625

BASIC DYEING

Hans Ortheil, deceased, late of Spartanburg, S.C. (by Hildegard M. Ortheil, administratrix), assignor to Kane and Company, Gastonia, N.C.

Filed Mar. 16, 1973, Ser. No. 342,183
Int. Cl.² D06P *1/68*
U.S. Cl. 8—82 8 Claims

1. A dyebath comprising in combination:
a body of liquid ammonia having a liquid organic solvent selected from the group consisting of tetrahydrothiophene 1—1 dioxide, dimethylsulfoxide and dimethylformamide dissolved therein, and a basic dyestuff compatible with said liquid ammonia, dissolved in said liquid organic solvent.

3,971,626

FAT-LIQUORING AGENT FOR WATERPROOFING LEATHER AND SKINS

Rudi Heyden, Hochdahl-Millrath, and Adolf Asbeck, Dusseldorf-Holthausen, both of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf, Germany

Filed Oct. 29, 1974, Ser. No. 518,247
Claims priority, application Germany, Nov. 3, 1973, 2355025
Int. Cl.² C14C *9/02*
U.S. Cl. 8—94.23 13 Claims

1. A process for manufacturing waterproof leather or skins, which comprises impregnating said leather or skins with an effective water-proofing amount of an aqueous fat-liquoring emulsion of a mixture of (A) an acid ester of citric acid with a fatty alcohol having 12 to 22 carbon atoms, and (B) an organic alcohol solvent for said ester of citric acid which is totally or partially soluble in water and which has a boiling point above 100°C., the ratio of component (A) to component (B) being between 9 : 1 and 1 : 9.

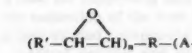
3,971,627

EPOXY-AZIDO COMPOUNDS

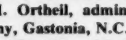
David S. Breslow, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 448,612, March 6, 1974, Pat. No. 3,941,751, which is a division of Ser. No. 301,003, Oct. 26, 1972, abandoned, which is a division of Ser. No. 85,300, Oct. 29, 1970, abandoned, which is a division of Ser. No. 843,230, July 18, 1969, Pat. No. 3,608,604. This application June 24, 1975, Ser. No. 589,981
Int. Cl.² D06M *13/38;* C07D *303/36*
U.S. Cl. 8—115.5 2 Claims

1. A polymer in the form of tire cord selected from polyesters, polyolefins, polyamides, polycarbonates, and rayon, modified by reaction with an epoxy-azido compound having the formula



where R is an organic radical selected from the group consisting of radicals derived by the removal of two or more hydrogen atoms from alkanes, cycloalkanes, alkylcycloalkanes, arenes, alkyl substituted arenes, alkylene-diarenes, dialkylcycloalkanes, alkyloxyalkanes, aryloxyarenes, alkaryloxyarenes, alkaryloxyalkarenes, aralkyloxyalkanes, aralkyloxyaralkanes, alkylthioalkanes, arylthioarenes, alkarylthioarenes, alkarylthioalkarenes, aralkylthioalkanes, aralkylthioaralkanes, alkylsulfonylalkanes, arylsulfonylarenes, alkarylsulfonylarenes, alkarylsulfonylalkarenes, aralkylsulfonylalkanes, aralkylsulfonylaralkanes, and the foregoing radicals with fluoro, chloro, bromo or iodo substituents, R′ is a radical selected from the group consisting of hydrogen, alkyl, cycloalkyl, aryl, and aralkyl radicals, A is a radical selected from the group consisting of



and n and m are integers from 1 to 10.

3,971,628

METHOD FOR INHIBITING RUST FORMATION ON IRON-CONTAINING ARTICLES

Ake Roland Albin Bresle, Stocksund, Sweden, assignor to Aminkemi AB, Bromma, Sweden

Division of Ser. No. 228,312, Feb. 22, 1972, abandoned. This application Nov. 21, 1974, Ser. No. 525,957
Claims priority, application Sweden, Mar. 9, 1971, 2955/71
Int. Cl.² C23F *11/00, 11/08*
U.S. Cl. 21—2.7 R 8 Claims

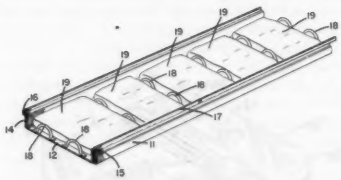
1. A method of inhibiting rust formation on the surfaces of an iron-containing article whose surfaces have lodged thereon corrosion accelerators selected from the group consisting of metal chloride, sulfur-containing compounds and water, said method comprising removing said corrosion accelerators by washing the article with a solution consisting essentially of 0.1 to 1.0 percent by weight of lithium hydroxide in an organic solvent in which lithium chloride and water are at least slightly soluble, and drying the article, whereby a protective layer is formed on the article.

3,971,629

RETORTING TRAY

Louis F. Buix, Crystal Lake; Harry J. Gribnitz, Addison, and Gary A. Hohner, Sleepy Hollow, all of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Feb. 3, 1975, Ser. No. 546,610
Int. Cl.³ A61L *3/02;* A23L *3/10*
U.S. Cl. 21—105 9 Claims



1. A tray for use in the retort sterilization of material contained in sealed flexible pouches, said tray comprising:
a. An elongated bottom;
b. Two elongated sidewalls extending upwards from opposite sides of said bottom;
c. Said sidewalls terminating in nesting means for stacking a plurality of like trays in a nesting configuration;
d. Two narrow ends at opposite ends of said bottom and at a right angle to said side-walls, said narrow ends being open;
e. Protuberances extending upwards from the bottom to space apart flexible pouches on the tray and to control the maximum cross section of the pouch during sterilization to insure complete, uniform and accurate heat penetration and sterilization of the contents of the pouch and to prevent substantial movement of the pouches on the tray, said protuberances being sufficiently open to allow for circulation of a heating medium about the trays;
f. Conduit means for circulating a heating medium around the bottom and the side-walls, said conduit means being

attached to the sidewalls of the tray and partially surrounding said tray on three sides.

3,971,630

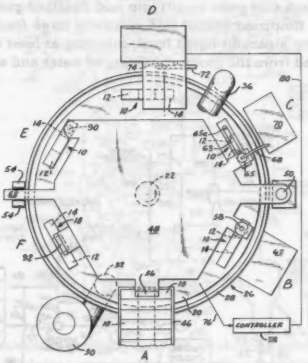
APPARATUS AND METHOD FOR BATCH-TYPE ANALYSIS OF LIQUID SAMPLES

Harold E. Sandrock, Rockville Centre; Edward W. Stark, Garden City, both of N.Y., and Steven A. Gyori, Allendale, N.J., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Oct. 7, 1975, Ser. No. 620,462

Int. Cl.² G01J *3/46*; G01N *21/24, 33/16*

U.S. Cl. 23—230 R **22 Claims**



7. A method for analyzing a constituent of interest in a liquid sample, comprising the steps of:

placing a container with its contents of such sample and at least one reagent in a chamber;

regulating the thermal environment within said chamber within limits;

determining the optical density of said contents within said container within said chamber subsequent to the combination of said contents;

sensing the temperature of said contents at a time other than during said determination and generating a signal in response thereto; and

extrapolating in response to said signal the real temperature of said contents at the time of said determination.

3,971,631

PELLETIZING ALKALI METAL POLYSILICATES

Guillermo Almagro, Aberdeen; Orlando L. Bertorelli; Robert K. Mays, both of Havre de Grace; Lloyd E. Williams, Bel Air, all of Md., and Howard F. Zimmerman, Jr., Athens, Tenn., assignors to J. M. Huber Corporation, Locust, N.J.

Division of Ser. No. 193,471, Oct. 28, 1971, Pat. No. 3,835,216. This application Aug. 26, 1974, Ser. No. 500,830

Int. Cl.² B01J *2/12, 2/14, 2/02*; C01B *33/32*

U.S. Cl. 23—313 AS **1 Claim**

1. A method for pelletizing finely divided alkali metal polysilicate particles comprising the steps of:

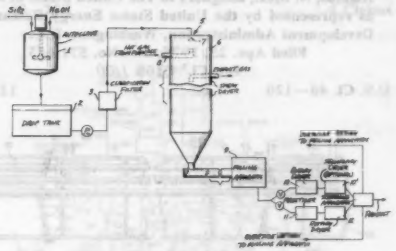
1. spray drying a silicate product by passing an aqueous mixture of silicate particles into the upper portion of a drying chamber and dispersing said mixture in the form of fine droplets in said chamber; the temperature of the inlet air to the spray drier being of the order of from about 400° to 1000°F.; whereby said droplets form minute hollow polysilicate microspheres;

2. collecting said spherical polysilicate droplets from the spray dryer and passing to a milling apparatus;

3. fracturing and pulverizing said hollow spheres in said milling apparatus to the extent that the density of the resulting fractured particles is increased to at least 25 lbs/cubic foot, and particles having sharp and uneven surfaces are formed;

4. passing said milled product to a rotating pelletizer vessel;

5. rotating said product in said rotating vessel at a temperature of 30°–150°C. while adding sufficient water thereto to increase the moisture content of the rotating product



to 30%, said rotation and moisture content being sufficient to dissolve the outer surfaces of said milled particles and effect incipient fusion of two or more of said particles to form a plurality of free-flowing particles of the pelletized material having continuously even surfaces, a bulk density of at least 55 pounds per cubic foot and a particle size of minus 8 plus 100 mesh; and

6. adding additional dry milled product to the resulting particles to reduce the moisture content to 25%.

3,971,632

SINTERED ABRASION RESISTANT IRON ALLOY HAVING A HOMOGENEOUS CARBIDE NETWORK

Berthold Menrad, Weiler i.d.B.; Karl Ripper, Schwabisch Gmund; Rudolf Ilg, Hofen, and Georg Dietrich, Schwabisch Gmund, all of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Germany

Filed Oct. 16, 1973, Ser. No. 406,834

Claims priority, application Germany, Oct. 20, 1972, 2251535

Int. Cl.² C22C *1/05*

U.S. Cl. 29—182.7 **1 Claim**

1. An abrasion resistant sintered iron alloy having a homogenous carbide network in a lamellated, perlitic base structure with interspersed residual austenite and martensite with a composition

1% – 1.35%	graphitic carbon
2% – 2.4%	manganese
1.4% – 1.7%	nickel
1%	copper
0.2%	copper borate

the remainder being essentially iron.

3,971,633

TWO LAYER COATING SYSTEM

Thomas A. Wolfla, and Robert C. Tucker, Jr., both of Indianapolis, Ind., assignors to Union Carbide Corporation, New York, N.Y.

Filed Feb. 10, 1975, Ser. No. 548,661

Int. Cl.² B32B *15/04*

U.S. Cl. 29—195 **8 Claims**

1. A coated structure consisting of a metallic substrate taken from the class of metals consisting of nickel-base and iron-base alloys; a first layer on said substrate consisting of chromium carbides and a binder taken from the class consist-

ing of nickel-chromium, cobalt-chromium, iron-chromium, and superalloys, said first layer being from 0.001 to 0.015 inches thick, and a surface layer consisting of pure chromium carbides said surface layer being from 0.0005 to 0.005 inches thick.

3,971,634

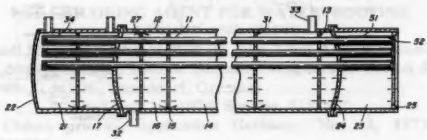
HEAT PIPE METHANATOR

William A. Ranken, and Joseph E. Kemme, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Apr. 25, 1975, Ser. No. 571,655

Int. Cl.[2] C10B 1/00

U.S. Cl. 48—120 12 Claims



1. A coal gas methanator of the type employing heat pipes comprising:

an elongated pressure shell having a methanation section, a preheat section, a heat exchanger section and a start-up heat exchanger section;

separating means for separating said heat exchanger section from said methanation section and for separating said start-up heat exchanger section from said methanation section;

a plurality of heat pipes enclosed in said elongated pressure shell;

heat pipe supporting means in said separating means;

A catalyst coating on the exterior walls of said plurality of heat pipes in said methanation section, said catalyst reacting hydrogen and carbon monoxide to produce methane in an exothermic reaction;

transfer means containing a working fluid within said plurality of heat pipes to transfer the heat of reaction at constant temperature from said methanation section to said preheat section, and to transfer remaining heat to said heat exchanger section; and

temperature control means including an inert gas in said plurality of heat pipes together with said working fluid to vary the amount of working fluid in the heat exchanger section, keeping the temperature in said methanation section constant.

10. In a heat pipe methanator, the combination of:

a reaction chamber and a heat exchanger;

a heat pipe having an evaporating section in operative relation with said reaction chamber and a condensing section in operative relation with said heat exchanger;

thimble means in said heat exchanger for receiving said condensing section;

means for containing a working fluid in said heat pipe; and

temperature control means including an inert gas in said heat pipe, held by said working fluid adjacent the end wall of said condensing section.

3,971,635

COAL GASIFIER HAVING AN ELUTRIATED FEED STREAM

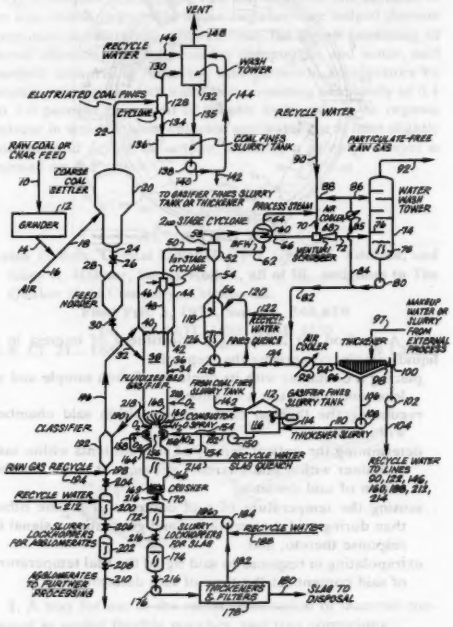
Charles W. Matthews, Allegheny County, Pa., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Dec. 23, 1974, Ser. No. 535,707

Int. Cl.[2] C10B 1/04; C10J 3/54, 3/56; C10K 1/08

U.S. Cl. 48—202 3 Claims

1. A process for gasifying feed ash-containing coal comprising crushing a feed coal stream to produce relatively large particulates and relatively small coal feed particulates, elutriating said relatively small feed particulates from said relatively large feed particulates, passing said relatively small feed particulates and at least one member selected from the group consisting of water and steam in addition to an oxygen-containing gas to a combustion zone to provide heat and reactants for said process, passing said relatively large feed particulates to a fluidized bed gasifier zone disposed upon grate means with said large feed particulates entering said gasifier zone above said grate means, maintaining said combustion zone under exothermic oxidation reaction conditions including a temperature between 2200° and 3300°F. and a residence time of up to 30 seconds to produce hot combustion gases and steam and to convert ash into molten slag, passing said hot combustion gases and steam upwardly from said combustion zone through said grate means into said fluidized gasifier zone to form a fluidizied bed of said relatively large feed particulates having a pseudo-liquid level, injecting at least one coolant selected from the group consisting of water and steam into



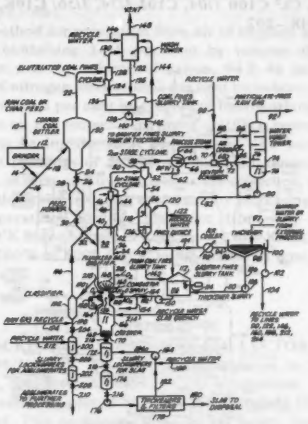
said hot combustion gases between said combustion zone and said grate means to solidify molten slag in said hot combustion gases, maintaining said gasifier zone under endothermic reducing conditions including a temperature between 1400° and 2000°F., and a pressure of at least 10 psi at which carbon dioxide and water vapor react with carbon to produce carbon monoxide and hydrogen, adjusting the crusher in said crushing step so that the size of said relatively large feed particulates is sufficient that they remain in said fluid bed for an average particle residence time of 5 to 60 minutes, withdrawing an overhead stream from said gasifier zone comprising carbon monoxide, hydrogen and water vapor, said overhead stream containing elutriated solid particulates from said fluid bed, said elutriated solid particulates having a lower carbon-to-ash weight ratio than the average carbon-to-ash weight ratio of the particles in said fluid bed, said elutriated solid particulates comprising substantially all the solid particulates removed from said gasifier zone, said process essentially avoiding removal of a stream of average carbon-to-ash weight ratio fluidized particulates from said fluid bed.

3,971,636

CONDENSATE SCRUBBING OF COAL GASIFIER PRODUCT

Charles W. Matthews, Pittsburgh, Pa., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Dec. 23, 1974, Ser. No. 535,708
Int. Cl.[2] C10B 1/04; C10J 3/54, 3/56; C10K 1/08
U.S. Cl. 48—202 9 Claims



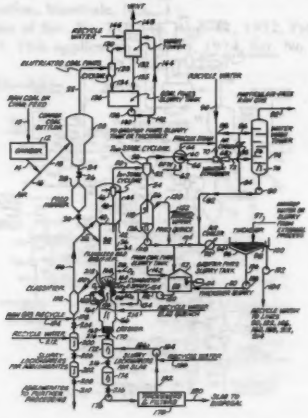
1. A process for gasifying feed ash-containing solid carbonaceous particulates comprising passing a first feed stream comprising a water slurry of carbonaceous particulates including char from said gasification process and oxygen-containing gas to a combustion zone to provide heat and reactants for said process, passing a second feed stream of carbonaceous particulates to a fluidized bed gasifier zone disposed upon grate means with said second feed stream entering said gasifier zone above said grate means, maintaining said combustion zone under exothermic oxidation reaction conditions including a temperature between 2200° and 3300°F. and a residence time of up to 30 seconds to produce hot combustion gases and steam and to convert ash into molten slag, passing said hot combustion gases and steam upwardly from said combustion zone through said grate means into said fluidized gasifier zone to form a fluidized bed of said second feed stream particulates having a psuedo-liquid level, injecting at least one coolant selected from the group consisting of water and steam into said hot combustion gases between said combustion zone and said grate means to solidify molten slag in said hot combustion gases, maintaining said gasifier zone under endothermic reducing conditions including a temperature between 1400° and 2000°F., a pressure of at least 10 psi and an average particle residence time of 5 to 60 minutes at which carbon dioxide and water vapor react with carbon to produce carbon monoxide and hydrogen, withdrawing an overhead stream from said gasifier zone comprising carbon monoxide, hydrogen, water vapor, and normally liquid and gaseous pollutants, said overhead stream containing elutriated solid particulates from said fluid bed, said elutriated solid particulates comprising substantially all the solid particulates removed from said gasifier zone, said elutriated solid particulates having a lower carbon-to-ash weight ratio than the average carbon-to-ash weight ratio of the particles in said fluid bed, said process essentially avoiding removal of a stream of average carbon-to-ash weight ratio fluidized solid particulates from said fluid bed, condensing said water vapor in said overhead stream to form condensate, scrubbing said elutriated solid particulates and said pollutants from said overhead stream with said condensate to form a condensate slurry containing said elutriated solid particulates and pollutants, said condensate slurry comprising at least a part of said first feed stream water slurry passed to said combustion zone.

3,971,637

COAL GASIFICATION PROCESS UTILIZING WASTE WATER FROM AN EXTERNAL PROCESS

Charles W. Matthews, Pittsburgh, Pa., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Dec. 23, 1974, Ser. No. 536,010
Int. Cl.[2] C10B 1/04; C10J 3/54, 3/56; C10K 1/08
U.S. Cl. 48—202 4 Claims



1. A process for gasifying feed ashcontaining solid carbonaceous particulates comprising passing a first feed stream comprising an aqueous mixture of carbonaceous particulates together with an oxygen-containing gas to a combustion zone to provide heat and reactants for said process, passing a second feed stream comprising carbonaceous particulates to a fluidized bed gasifier zone disposed upon grate means with said second feed stream entering said gasifier zone above said grate means, said aqueous mixture comprising at least in part waste water containing at least one member selected from the group consisting of combustible pollutants and slag-forming salts, maintaining said combustion zone under exothermic oxidation reaction conditions including a temperature between 2200° and 3300°F. and a residence time of up to 30 seconds to produce hot combustion gases and steam and to convert ash into molten slag, passing said hot combustion gases and steam upwardly from said combustion zone through said grate means into said fluidized gasifier zone to form a fluidized bed of said second feed stream particulates having a pseudo-liquid level, injecting at least one coolant selected from the group consisting of water and steam into said hot combustion gases between said combustion zone and said grate means to solidify molten slag in said hot combustion gases, maintaining said gasifier zone under endothermic reducing conditions including a temperature between 1400° and 2000°F., an average particle residence time of 5 to 60 minutes, and a pressure of at least 10 psi at which carbon dioxide and water vapor react with carbon to produce carbon monoxide and hydrogen, withdrawing an overhead stream from said gasifier zone comprising carbon monoxide, hydrogen and water vapor, said overhead stream containing elutriated solid particulates from said fluid bed, said elutriated solid particulates having a lower carbon-to-ash weight ratio than the average carbon-to-ash weight ratio of the particles in said fluid bed, said elutriated solid particulates comprising substantially all the fluidized solid particulates removed from said gasifier zone, said process essentially avoiding removal of a stream of average carbon-to-

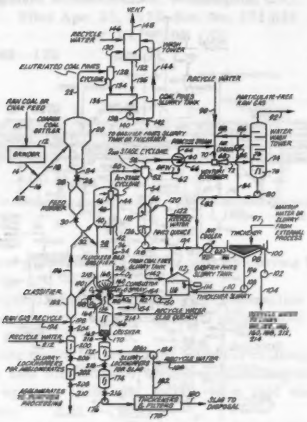
ash weight ratio fluidized solid particulates from said fluid bed.

3,971,638

COAL GASIFICATION PROCESS UTILIZING HIGH SULFUR CARBONACEOUS MATERIAL

Charles W. Matthews, Pittsburgh, Pa., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Dec. 23, 1974, Ser. No. 536,011
Int. Cl.[2] C10B *1/04*; C10J *3/54*, *3/56*; C10K *1/08*
U.S. Cl. 48—202 5 Claims



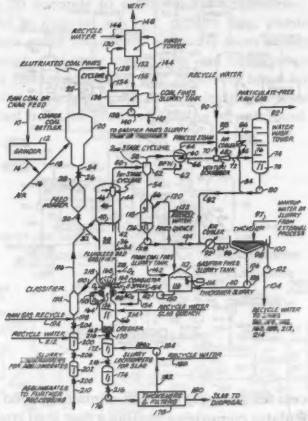
1. A process for gasifying feed ashcontaining solid carbonaceous particulates comprising passing a first feed stream of carbonaceous particulates together with an oxygen-containing gas to a combustion zone to provide heat and reactants for said process, passing a second stream of carbonaceus particulates to a fluidized bed gasifier zone disposed upon grate means with said second feed stream entering said gasifier zone above said grate means, said first feed stream comprising at least in part sulfur-containing carbonaceous residue material, maintaining said combustion zone under exothermic oxidation reaction conditions including a temperature between 2200° and 3300°F. and a residence time of up to 30 seconds to produce hot combustion gases and steam and to convert ash into molten slag, passing said hot combustion gases and steam including sulfur dioxide derived from said sulfur-containing carbonaceous material upwardly from said combustion zone through said grate means into said fluidized gasifier zone to form a fluidized bed of said second feed stream particulates having a pseudo-liquid level, injecting at least one coolant selected from the group consisting of water and steam into said hot combustion gases between said combustion zone and said grate means to solidify molten slag in said hot combustion gases, maintaining said gasifier zone under endothermic reducing conditions including a temperature between 1400° and 2000°F., a pressure of at least 10 psi and an average particle residence time of 5 to 60 minutes at which carbon dioxide and water vapor react with carbon to produce carbon monoxide and hydrogen, withdrawing an overhead stream from said gasifier zone comprising carbon monoxide, hydrogen water vapor, and hydrogen sulfide but substantially free of sulfur dioxide, said overhead stream containing elutriated solid particulates from said fluid bed which are fed to said combustion zone as part of said first feed stream, said elutriated solid particulates having a lower carbon-to-ash weight ratio than the average carbon-to-ash weight ratio of the particles in said fluid bed, said elutriated solid particulates comprising substantially all the fluidized solid particulates removed from said gasifier zone, said process essentially avoiding removal of a stream of average carbon-to-ash weight ratio fluidized particulates from said fluid bed.

3,971,639

FLUID BED COAL GASIFICATION

Charles W. Matthews, Pittsburgh, Pa., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Dec. 23, 1974, Ser. No. 536,027
Int. Cl.[2] C10B *1/04*; C10J *3/54*, *3/56*; C10K *1/08*
U.S. Cl. 48—202 13 Claims



1. A process for gasifying feed ash-containing solid carbonaceous particulates comprising passing a first feed stream comprising carbonaceous particulates together with at lest one member selected from the group consisting of water and steam in addition to an oxygen-containing gas to a combustion zone to provide heat and reactants for said process, passing a second feed stream of carbonaceous particulates to a fluidized bed gasifier zone disposed upon grate means with said second feed stream entering said gasifier zone above said grate means, maintaining said combustion zone under exothermic oxidation reaction conditions including a temperature between 2200° and 3300°F. and a residence time of up to 30 seconds to produce hot combustion gasses and steam and to convert ash into molten salg, passing said hot combustion gases and steam upwardly from said combustion zone through said grate means into said gasifier zone to form a fluidized bed of said second feed stream particulates having a pseudo-liquid level, injecting at least one coolant selected from the group consisting of water and steam into said hot combustion gases between said combustion zone and said grate means to solidify molten slag in said hot combustion gases, maintaining said gasifier zone under endothermic reducing conditions including a temperature between 1400° and 2000°F., a pressure of at least 10 psi and an average particle residence time of 5 to 60 minutes at which carbon dioxide and water vapor react with carbon to produce carbon monoxide and hydrogen, withdrawing an overhead stream from said gasifier zone comprising carbon monoxide, hydrogen and water vapor, said overhead stream containing elutriated solid particulates elutriated from said fluid bed, said elutriated solid particulates having a lower carbon-to-ash weight ratio than the average carbon-to-ash weight ratio of the particles in said fluid bed, said elutriated solid particulates comprising substantially all the fluidized solid particulates removed from said gasifier zone, said process essentially avoiding removal of a steam of average carbon-to-ash weight ratio fluidized solid particulates from said fluid bed.

3,971,640

METHOD OF SEPARATING KRYPTON-XENON CONCENTRATE FROM AIR

Georgy Anatolievich Golovko, Pushkin 8, bulvar A. Tolstogo, 16, kv. 29, Leningrad, U.S.S.R.

Filed Mar. 18, 1975, Ser. No. 559,410

Claims priority, application U.S.S.R., Apr. 26, 1974, 2015806

Int. Cl.² B01D *53/04*

U.S. Cl. 55—66 4 Claims

1. A method for separation from air of krypton-xenon concentrate containing 1–46 per cent by volume of krypton, 0.1–4 per cent by volume of xenon, 94.9–46 per cent by volume of nitrogen, maximum 2 per cent by volume of oxygen and maximum 2 per cent by volume of hydrocarbons, consisting in that air at a temperature of 90°–110°K is passed through adsorbents having the same temperature and having pores with inlet openings of 5–150 A, on which xenon, krypton, nitrogen, oxygen and hydrocarbons are adsorbed; said gases are then desorbed from the adsorbent by increasing step-wise the temperature of the adsorbent from 90°–110°K to 250°–280°K in the course of time from 1 to 3 hours, and from to 250°–280°K to 500°–650°K in the course of time from 2 to 4 hours.

3,971,641

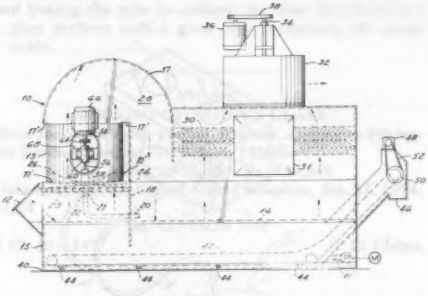
GAS SCRUBBER OF THE WET COLLECTOR TYPE

Earl J. McNamara, Trenton, Mich., assignor to Taylor & Gaskin, Inc., Detroit, Mich.

Continuation-in-part of Ser. No. 488,587, July 15, 1974, abandoned. This application Feb. 24, 1975, Ser. No. 552,170

Int. Cl.² B01D *47/02*, *47/08*

U.S. Cl. 55—223 5 Claims



1. A gas scrubber of the wet collector type comprising, in combination:

a housing defining a gas inlet and a gas outlet and a liquid reservoir,

gas exhaust means cooperating with the housing for moving gas therethrough under a negative pressure from the inlet to the exhaust means and forcing it out through the gas outlet,

a tunnel extending into the housing in the path of negative pressure gas flow therethrough and open to the atmosphere at least at one end,

a spinner shaft in the tunnel projecting at one end through an opening in a wall thereof and into the path of gas flow through the housing, with the opening being larger than the spinner shaft but closely surrounding the shaft to create an atmospheric flow from the tunnel around the shaft and into the housing sufficient to substantially prevent entry of scrubbing liquid and/or contaminates into the tunnel through the opening around the shaft,

bearing means located entirely within the tunnel and spaced from said opening around the spinner shaft and comprising the sole support for the spinner shaft and supporting it for rotation,

liquid diffusing spinner means mounted on said one end of the spinner shaft outside the tunnel and arranged to diffuse a stream of liquid striking it in a spray pattern extending across the path of gas flow,

and liquid delivery means for withdrawing liquid from the liquid reservoir and directing a stream of the liquid against the diffusing spinner to diffuse the same into a pattern as aforesaid.

3,971,642

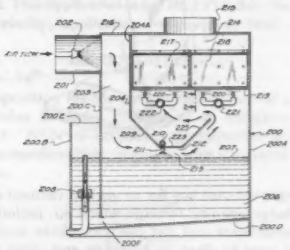
GAS SCRUBBER

Manuel Perez, River Vale, N.J., assignor to Aerosols Control Corporation, Montvale, N.J.

Division of Ser. No. 279,848, Aug. 11, 1972, Pat. No. 3,856,487. This application Dec. 18, 1974, Ser. No. 533,860

Int. Cl.² B01D *47/00*

U.S. Cl. 55—223 6 Claims



1. Gas scrubbing apparatus comprising

a box-like housing having a pair of side walls, a liquid-filled sump extending between said side walls at the bottom of said housing, a gas inlet disposed above the surface of the sump liquid between said side walls adjacent one end of said housing for receiving a flow of gas to be scrubbed, and a gas outlet disposed above said sump liquid surface between said side walls adjacent the other end of said housing for discharging said gas flow after scrubbing;

baffle means in the interior of said housing connected between said side walls above said sump liquid surface and cooperating with said surface of the liquid in said sump to form a passageway for said gas flow connecting the gas inlet with the gas outlet, said baffle means having a fixed Venturi baffle comprising a substantially planar central section connected between said housing side walls and disposed substantially parallel to said surface of the liquid in said sump to form a throat portion of reduced cross-sectional area in said passageway having a direction of gas flow therethrough which is substantially parallel to said sump liquid surface, a substantially planar inlet section connected between said side walls and disposed at an acute angle with respect to said central section on the upstream side of said central section, and a substantially planar outlet section connected between said side walls and disposed at an acute angle with respect to said central section on the downstream side of said central section;

spray means mounted on the central section of said fixed Venturi baffle for producing a curtain of liquid spray across said passageway throat portion substantially perpendicular to the direction of gas flow therethrough; and

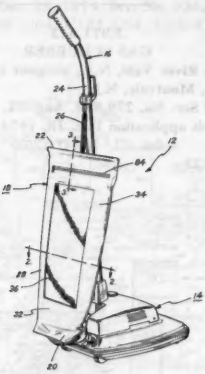
means for controlling the level of liquid in said sump to thereby control the cross-sectional area of said passageway throat portion, whereby gas passing through said throat portion from said gas inlet to said gas outlet is increased in velocity and turbulence and scrubbed by the liquid spray.

3,971,643

VACUUM CLEANER INCLUDING DUST BAG AND FILTER

Austen B. Hufton, Glen Ellyn, Ill., assignor to Servicemaster Industries, Inc., Downers Grove, Ill.

Filed Mar. 31, 1975, Ser. No. 563,505
Int. Cl.² B01D *46/02*
U.S. Cl. 55—372 **9 Claims**



1. An improved dust bag for an upright vacuum cleaner that has a discharge opening through which air, including various sized entrained dust and dirt particles, flows under pressure and that is used to clean in hospitals and other health care facilities wherein it is important to minimize the dispersion of dust and dirt, the improved dust bag comprising:

inlet conduit means adapted to be connected with the discharge outlet of the upright vacuum cleaner so that air, including the entrained dust and dirt particles from the upright vacuum cleaner, is introduced into and flows through the inlet conduit means;

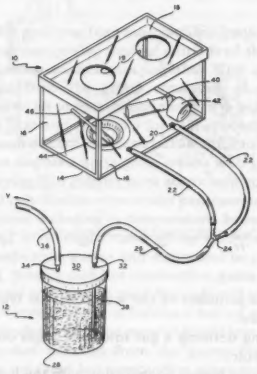
a generally closed, air pervious, first bag having an exterior wall made of air pervious material and including an inlet connected with the inlet conduit means so that air, including the entrained dust and dirt particles discharged from the upright vacuum cleaner, is introduced, under pressure, into the interior of the first bag, with the air, together with the smaller sized dust and dirt particles, then passing through the air pervious walls of the first bag; means for securing the inlet of the first bag to the inlet conduit means; a generally closed, air impervious, second bag having an exterior wall made of air impervious material and being disposed about the first bag so that the first bag is completely enclosed within the second bag, the lower end of the second bag having an inlet portion connected about the inlet conduit means so that air within the second bag cannot escape from the second bag between the inlet portion of the second bag and the inlet conduit means, the second bag having a relatively flexible, air impervious inner wall that has its marginal edges secured to the exterior wall of the second bag and extends across the interior of the second bag so that the inner wall, together with the exterior wall of the second bag, defines a first compartment and a second compartment within the second bag, with the first bag being disposed entirely within the second compartment; means for securing the inlet portion of the second bag to the inlet conduit means; a first, relatively large opening formed in the portion of the second bag exterior wall defining the first compartment; a second, relatively large opening formed in the inner wall of the second bag, with the second opening being aligned with the first opening and having a size and shape generally corresponding to the size and shape of the first opening and with the first and second openings constituting the path through which air from the first bag passes out of the second bag; a filter including a frame and a fiber glass felt filtering media, with the diameters of the fibers of the filtering media being in the range of 0.75 microns, the filtering media having a shape corresponding to the shape of the first opening and having a size greater than the size of the first opening, the filter frame being disposed and supported within the first compartment of the second bag so that the filtering media is disposed in the path through which air from the first bag passes out of the second bag and is in filtering communication with the air flowing through the first and second openings, so that all air passing through the first and second openings must pass through the filtering media and so that the small sized dust and dirt particles entrained in the air passing through the first and second openings are filtered out of the air with the air flowing through the first and second openings biasing the portions of the inner wall surrounding the second opening against the filter so as to form a seal between these inner wall portions and the filter so that the filter is clamped between the inner wall and the portion of the second bag exterior wall which defines the first compartment.

3,971,644

MIXING AND DETOXIFICATION TANK WITH FILTRATION SYSTEM

Edward D. Sugarman, Fayetteville, N.Y., assignor to Wal-Gen Corporation, Syracuse, N.Y.

Filed Aug. 28, 1974, Ser. No. 501,025
Int. Cl.² B01D *53/34*
U.S. Cl. 55—387 **2 Claims**



1. For use with a hospital vacuum source, operating room mixing and detoxification apparatus comprising a tank having a bottom, side walls and a removable top, at least the side walls and top of the tank being made of transparent material, the tank being particularly adapted for mixing a cement that gives off toxic fumes during the mixing, the top of the tank being formed with a pair of open arm holes through which the arms of an operator can extend downwardly into the tank interior to do the mixing, the holes being dimensioned so as to encircle the operator's arms with a close but non-sealing fit whereby ambient room air can pass through the holes around the operator's arms and assist in flushing toxic fumes out of the tank, and filtration means for the tank, the tank having at least one exhaust port located adjacent the bottom thereof, the exhaust port being connected through the filtration means to the hospital vacuum source.

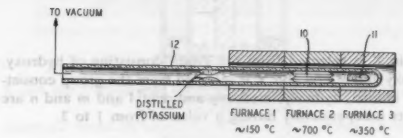
3,971,645
METHOD OF MAKING COMPOUND-GLASS OPTICAL WAVEGUIDES FABRICATED BY A METAL EVAPORATION TECHNIQUE

Klaus Jürgen Bachmann, Piscataway; Suzanne Rose Nagel, North Plainfield; Arthur David Pearson, Bernardsville; Paul Herman Schmidt, Chatham, and Arthur Richard Tynes, Red Bank, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 12, 1975, Ser. No. 612,762

Int. Cl.² C03C *17/08;* **G02B** *5/14*

U.S. Cl. 65—3 A **7 Claims**



1. A method for making a glass preform useful for drawing optical fibers comprising the steps of:

sealing into a high purity silica tube at reduced pressure a quantity of a metal selected from the group consisting of Cs, Rb, K, Cd, Na, Zn, Mg, and Li,

heating the tube to react the metal with the interior wall of the tube to form a metal silicide coating on the interior wall,

heating the tube in the presence of oxygen at a temperature above approximately 1600°C to form a mixture of metal oxide and silica and to simultaneously diffuse the metal significantly into the interior wall of the silica tube,

and heating the tube to collapse the tube thus forming a glass preform with a glass core comprising the metal oxide.

3,971,646
STIRRING OF MOLTEN GLASS

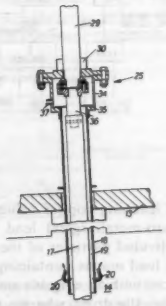
William Jackson Rhodes, Prescot, England, assignor to Pilkington Brothers Limited, St. Helens, England

Filed Jan. 8, 1975, Ser. No. 539,569

Claims priority, application United Kingdom, Jan. 11, 1974, 1461/74

Int. Cl.² C03B *5/18*

U.S. Cl. 65—157 **12 Claims**



1. In a glass melting furnace, a stirrer for stirring molten glass, which stirrer comprises a stirring member for immersion in the molten glass, a rotary shaft extending upwardly from the stirring member to a roof of the furnace, the shaft being rotatably mounted and connected to a drive device arranged to rotate the stirrer, a stationary hollow casing formed of a material which contains a high percentage of platinum surrounding the rotary shaft in spaced relationship thereto, the casing extending downwardly from the roof of the furnace, terminating above the stirring member, and being separate therefrom, and separate inlet and outlet means in the casing for introducing and removing a flow of inert gas through the space between the casing and the shaft whereby the atmosphere between the shaft and the casing may be different from the atmosphere above the molten glass in the remainder of the furnace, the shaft and stirring member being formed of a material resistant to attack by molten glass and different from the material of the hollow casing.

3,971,647
COMPOSITION FOR THE REGULATION OF PLANT GROWTH

Karl Gaetzi, Basel, and Hanspeter Fischer, Bottmingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 340,428, March 12, 1973, abandoned. This application Aug. 28, 1974, Ser. No. 501,395

Claims priority, application Switzerland, Mar. 17, 1972, 4058/72

Int. Cl.² A01N *5/00*

U.S. Cl. 71—76 **4 Claims**

1. A composition for the growth retardation of soya plants which contains as active compound an effective retarding amount of N^1,N^1-di-iso-propyl-N^2-methyl-N^2-dodecyl-formamidinium-methosulfate, together with a suitable inert carrier therefor.

3,971,648
HERBICIDAL USE OF CARBOXYALKYL ESTER OF N-PHOSPHONOMETHYL GLYCINE

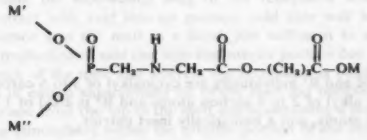
John E. Franz, Crestwood, and Hans L. Nufer, Creve Coeur, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 417,858, Nov. 21, 1973, Pat. No. 3,868,407. This application Sept. 16, 1974, Ser. No. 506,139

Int. Cl.² D01N *9/36*

U.S. Cl. 71—86 **7 Claims**

1. The herbicidal method which comprises contacting a plant with a herbicidally effective amount of a compound of the formula



wherein M is hydrogen, alkali metal, alkaline earth metal, ammonium or organic ammonium, M' and M'' are hydrogen, alkali metal, alkaline earth metal, ammonium or organic ammonium, said organic ammonium group being derived from an organic amine having a molecular weight below about 300 and containing not more than two amine groups.

3,971,649
S-METHYL-N-[4-(4'-CHLOROPHENOXY)PHENYL] THIOLCARBAMATE

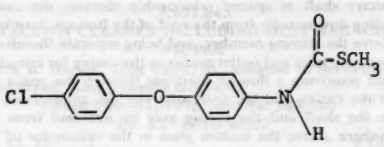
Don R. Baker, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed July 23, 1975, Ser. No. 598,485

Int. Cl.² C07C *155/02;* **A01N** *9/12*

U.S. Cl. 71—100 **3 Claims**

2. A method of controlling undesirable vegetation comprising applying to the locus thereof an herbicidally effective amount of a compound having the formula



3,971,650

HERBICIDAL N^1-METHOXYCARBONYL-N^1-ALKYL-3,5-DINITRO-N^4-N^4-DIALKYLSULFANILAMIDE

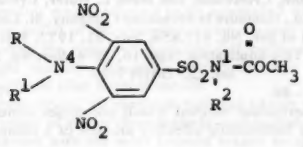
William L. Schinski, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 375,304, June 29, 1973, abandoned. This application Dec. 17, 1974, Ser. No. 533,560

Int. Cl.[2] A01N *9/14*

U.S. Cl. 71—103 7 Claims

1. A herbicidal composition for the selective control of crabgrass which comprises a herbicidally effective amount of the compound of the formula



(1)

wherein R and R^1 individually are cycloalkyl of 3 to 6 carbon atoms or alkyl of 2 to 4 carbon atoms and R^2 is alkyl of 1 to 3 carbon atoms, and a biologically inert carrier.

3,971,651

PLANT GROWTH MODIFIER AND A PROCESS FOR PREPARATION THEREOF

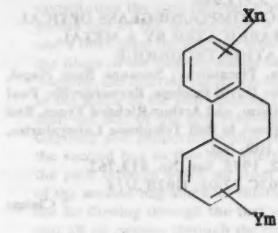
Tohru Hashimoto, Musashino; Akira Kawarada, and Sachiko Tamura, both of Tokyo, all of Japan, assignors to Rikagaku Kenkyusho, Japan

Division of Ser. No. 331,498, Feb. 12, 1973, Pat. No. 3,917,477. This application Apr. 22, 1975, Ser. No. 570,960

Int. Cl.[2] A01N *9/24*

U.S. Cl. 71—122 6 Claims

1. A method for inhibiting the growth and germination of higher plants which comprises applying thereto an effective amount of a compound of the formula:



wherein X is selected from the group consisting of hydroxy, methoxy and acetyl and Y is selected from the group consisting of chloro, hydroxy, methoxy and acetyl and *m* and *n* are integers independently having a value of from 1 to 3.

3,971,652

AMMONIACAL EXTRACTION OF COPPER FROM METALLIC MATERIALS

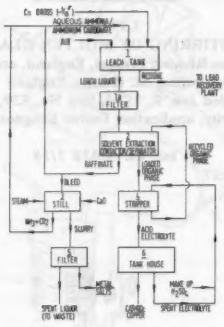
Joseph Lindsey Bryson, deceased, late of Blackwell, England (by Margaret Monteith Bryson, administratrix), assignor to Metallurgical Development Company, Nassau, Bahamas

Continuation-in-part of Ser. No. 334,482, Feb. 21, 1973, abandoned. This application Mar. 28, 1975, Ser. No. 562,894

Claims priority, application United Kingdom, Feb. 21, 1972, 7945/72

Int. Cl.[2] C01G *1/10*; C22B *15/10*

U.S. Cl. 75—.5 A 7 Claims



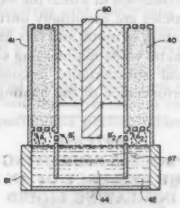
1. A method of leaching copper values from copper dross obtained from pyro-metallurgical lead bullion, comprising contacting finely-divided particles of the copper dross in the form of a metallic lead matrix containing copper and copper compound inclusions with an aqueous ammoniacal solution to dissolve copper from the dross, wherein the leaching solution further contains both sulphate and carbonate ions, the ammonium concentration being at least 15 grams per liter, expressed as NH_3, there being from 0.5 to 4.0 moles of ammonia per mole of total carbonate and sulphate ions, and the mole ratio of sulphate to carbonate in the leaching solution being from 1:3 to 3:1.

7. The method as claimed in claim 1 further comprising recovering copper powder in the leachate solution by treatment with a reducing agent.

3,971,653
CARBOTHERMIC PRODUCTION OF ALUMINUM

C. Norman Cochran, Oakmont, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 9, 1974, Ser. No. 530,656
Int. Cl.[2] C22D 7/02
U.S. Cl. 75—10 R 9 Claims

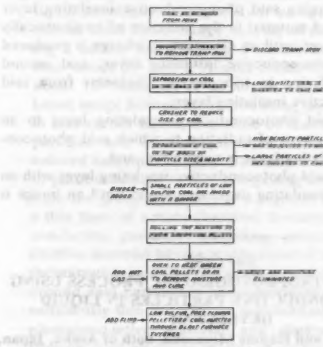


1. A process for producing aluminum, comprising the steps of forming from Al_2O_3 and C in the ratio one mol Al_2O_3 to 3 mols C, a first liquid of Al_2O_3 and Al_4C_3 accompanied by the evolution of gases, creating in said first liquid a zone of increased temperature and/or decreased pressure to decompose said first liquid to a second liquid of Al and C, exhausting said gases during the step of forming said first liquid without said gases passing through said second liquid, and recovering Al from said second liquid.

3,971,654
METHOD OF INJECTING PELLETIZED COAL THROUGH BLAST FURNACE TUYERES

Edgar B. Mancke, Bethlehem, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Oct. 16, 1974, Ser. No. 515,289
Int. Cl.[2] C21B 5/00
U.S. Cl. 75—42 8 Claims



1. The method of smelting iron in a blast furnace having a smelting zone, a hearth section, and a plurality of tuyeres disposed between the smelting zone and hearth section for the introduction of low pyritic sulfur bearing coal pellets into said blast furnace, said method comprising:

a. crushing coal having a disproportionately large amount of pyritic sulfur into fine particles whose size is less than 14 mesh,

b. separating the crushed fine particles by mechanical means into a first portion having a lower pyritic sulfur content than said coal prior to crushing, and a second portion having a higher pyritic sulfur content than said coal prior to crushing,

c. mixing the first portion of the fine coal particles with a binder,

d. forming such mixture of fine coal particles and binder into agglomerates,

e. heating the agglomerates to form stabilized coal pellets low in pyritic sulfur,

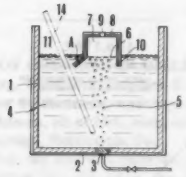
f. entraining the stabilized coal pellets in a fluid stream, and

g. introducing the fluid stream of entrained low pyritic sulfur pellets through said tuyeres.

3,971,655
METHOD FOR TREATMENT OF MOLTEN STEEL IN A LADLE

Kiyoshi Takashima; Keizi Arima; Takeshi Shozi, all of Sakai, and Hisashi Mori, Kitakyushu, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Aug. 21, 1974, Ser. No. 499,162
Int. Cl.[2] C21C 5/34
U.S. Cl. 75—59 6 Claims



1. In a method for refining a melt of molten steel by gas blowing in a ladle, said melt having a layer of slag on the surface thereof wherein an inert gas is bubbled upwardly from the bottom of the ladle through the melt to agitate and induce turbulence in the melt and remove impurities therefrom, said process being carried out under atmospheric pressure, the improvement which comprises partially immersing an inverted receptable having side walls into the surface of the melt such that a portion of the interior of the receptacle is above the surface of the melt and to create a slag-free melt surface within the side-walled area of the receptacle which is in contact with said interior portion, said side wall being immersed into the melt to a depth just sufficient to avoid the introduction of said slag into the interior portion due to turbulence of the melt and wherein the receptacle is positioned so as to entrap substantially all of the inert gas bubbles as they escape from the top of the melt and maintaining a non-oxidizing atmosphere within the interior portion of the receptacle.

3,971,656
SPINODAL CARBONITRIDE ALLOYS FOR TOOL AND WEAR APPLICATIONS

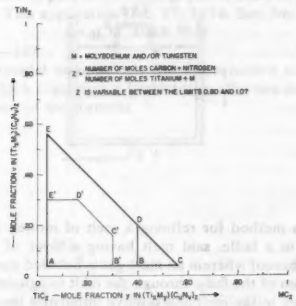
Erwin Rudy, 15750 NW. Oak Hill Drive, Beaverton, Oreg. 97005

Continuation-in-part of Ser. No. 370,865, June 18, 1973, abandoned. This application May 29, 1974, Ser. No. 473,501
Int. Cl.[2] C22C 1/05, 29/00
U.S. Cl. 75—203 14 Claims

1. A composition of material comprising sintered carbonitride-binder metal alloys in which the carbonitride has the formula $(Ti_xM_y)(C_uN_v)_z$, where M is a Group VI metal, with $x + y = 1$, $u + v = 1$, and $0.80 \leq z \leq 1.07$, and where the value of y is from 0.04 to 0.40 and the range of the value of v is a function of y, with the upper limit of the value of v as a function of y being defined by the line ED of FIG. 1 and the lower limit of the value of v as a function of y being defined by the line AB of FIG. 1, in which the binder is selected from metals of the iron group and metals of the group VI refractory

transition metals and comprises between 5 and 45 weight percent of the composition, and in which the carbonitride component of the alloy is a two phase mixture comprising a titanium and nitrogen-rich carbonitride solid solution, and another hard phase which is rich in the group VI metal components and poor in nitrogen, and the two-phase mixture forming a microstructure in which the titanium and nitrogen-rich carbonitride phase is surrounded by the phase rich in group VI metals but poor in nitrogen and forms the main interface with the binder alloy.

13. The method of forming a composition of material comprising sintered carbonitride-binder metal alloys, in which the carbonitride has the formula $(Ti_xM_y)(C_uN_v)_z$, where M is a group VI metal, with $x+y=1$, $u+v=1$, and $0.80 \leq z \leq 1.07$, and where the value of y is from 0.04 to 0.40 and the range of the value of v is a function of y, with the upper limit of the value of v as a function of y being defind by the line ED of FIG. 1 and the lower limit of the vaue of v as a function of y being defined by the line AB of FIG. 1, and in which the carbonitride component of the alloy is a two-phase mixture comprising a titanium and nitrogen-rich carbonitide solid solution, and another hard phase which is rich in the group VI


M = MOLYBDENUM AND/OR TUNGSTEN
Z = NUMBER OF MOLES CARBON + NITROGEN / NUMBER OF MOLES TITANIUM + M
Z IS VARIABLE BETWEEN THE LIMITS 0.80 AND 1.07
MOLE FRACTION = IN (Ti$_x$M$_y$)(C$_u$N$_v$)$_z$
TiC$_z$ — MOLE FRACTION y IN (Ti$_x$M$_y$)(C$_u$N$_v$)$_z$ → MC$_z$

metal components and poor in nitrogen, and the two-phase mixture forming a microstructure in which the titanium and nitrogen-rich carbonitride phase is surrounded by the phase rich in group VI metals but poor in nitrogen and forms the main interface with the binder alloy, comprising the steps of:

forming carbonitride alloy powders by reacting mixtures of metal and metal carbide powders with niteogen gas at temperatures between 1400° and 1800°C to form a homogeneous solution at these temperatures;

cooling the carbonitride alloy powder to cause it to decompose into a two-phase mixture comprising a titanium and nitrogen-rich carbonitride solid solution, and another hard phase which is rich in the group VI metal components and poor in nitrogen, with the two-phase mixture forming a microstructure in which the titanium and nitrogen-rich carbonitride phase is surrounded by the phase rich in group VI metals but poor in nitrogen;

adding binder material to the mixture;

mechanically milling the mixture under inert fluids until it has uniform consistency and the desired grain size;

compacting the mixture into a desired shape; and sintering the compacts so formed at an elevated temperature.

3,971,657

SINTERING OF PARTICULATE METAL

Edul M. Daver, Westfield, N.J., assignor to Alcan Aluminum Corporation, Cleveland, Ohio

Filed Feb. 13, 1974, Ser. No. 442,062

Int. Cl.² B22F 3/10

U.S. Cl. 75—211 **12 Claims**

1. In a method of making sintered metal articles from particulate metals, the steps of

a. mixing a major proportion of particulate metal comprising aluminum particles having an oxide coating with a minor proportion of a flux consisting essentially of an intimate mixture of potassium fluoaluminate complexes essentially free of unreacted potassium fluoride;

b. disposing, for heating to produce a sintered article, a quantity of the mixture of metal and flux in a substantially uncompacted condition in which the oxide coatings of the aluminum particles are essentially unruptured; and

c. heating the mixture of metal and flux to a temperature for sintering the metal while maintaining said quantity of the mixture in said substantially uncompacted condition throughout performance of the heating step.

3,971,658

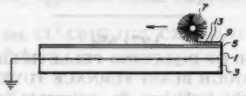
IMAGING PROCESS EMPLOYING FRICTION CHARGING IN THE PRESENCE OF AN ELECTRICALLY INSULATING LIQUID

William L. Goffe, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 341,217, March 14, 1973, Pat. No. 3,907,559, which is a continuation-in-part of Ser. No. 863,664, Oct. 3, 1969, abandoned, which is a continuation-in-part of Ser. No. 553,438, May 27, 1966, abandoned. This application Apr. 24, 1975, Ser. No. 571,196

Int. Cl.² G03G 13/02, 13/10

U.S. Cl. 96—1 C **9 Claims**



1. An imaging process comprising:

a. providing a photoconductive insulating layer on an electrically conductive substrate;

b. friction charging said photoconductive insulating layer with a second material in the presence of an electrically insulating layer until an electrostatic charge is produced on said photoconductive insulating layer, said second material differing in triboelectric character from said photoconductive insulating layer;

c. exposing said photoconductive insulating layer to an imagewise pattern of radiation to which said photoconductive insulating layer is responsive; and

d. contacting said photoconductive insulating layer with an electrically insulating developer liquid until an image is formed.

3,971,659

COLOR ELECTROPHOTOGRAPHIC PROCESS USING PHOTOCONDUCTIVE PARTICLES IN LIQUID DEVELOPER

Masamichi Sato, and Hajime Miyazuka, both of Asaka, Japan, assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 887,980, Dec. 24, 1969, abandoned. This application Nov. 13, 1974, Ser. No. 523,612

Claims priority, application Japan, Dec. 28, 1968, 44-980

Int. Cl.² G03G 5/12, 13/01, 9/00

U.S. Cl. 96—1.2 **11 Claims**

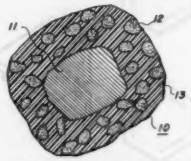
1. The method of producing a multicolor reproduction of an original colored object comprising the steps of:

a. charging a photoconductive insulating layer;

b. exposing the charged layer to said original colored object through a colored filter to form a first primary color coded electrostatic latent image on said layer;

c. developing said first electrostatic latent image with a liquid developer having a color complementary to said

first color coded latent image, said liquid developer comprising a carrier liquid having a dielectric constant of less than about 3.4 and a volume resistivity of greater than about 10^{10} ohm-cm so as not to affect an electrostatic latent image formed on an insulating layer, and dispersed in said carrier liquid, a mixture of discrete colored toner particles and discrete photoconductive particles, said colored toner particles substantially lacking the property of photoconductivity and comprising a colorant selected from the group consisting of a pigment and a dye having a thin layer of a resin absorbed therearound, said photoconductive particles comprising particulate photoconductive material having a thin layer of a resin absorbed therearound, said thin layer of said resin absorbed therearound said particulate photoconductive material being



sufficiently thin to facilitate exposure of said particulate photoconductive material and dissipate any charge thereon, said photoconductive particles being present in an amount of from about 5 to about 104 parts by weight for every 100 parts by weight of said colored toner particles;

d. contacting said photoconductive insulating layer with an insulating liquid other than the developer liquid to neutralize any residual charge in the portion of said layer developed in step (c);

e. charging said photoconductive insulating layer;

f. exposing the charged layer to said original colored object through a colored filter to form a second primary color coded electrostatic latent image on said layer;

g. developing said second electrostatic latent image with a liquid developer having a color complementary to said second color coded image; said liquid developer comprising a carrier liquid having a dielectric constant of less than about 3.4 and a volume resistivity of greater than about 10^{10} ohm-cm so as not to affect an electrostatic latent image formed on an insulating layer, and dispersed in said carrier liquid, a mixture of discrete colored toner particles and discrete photoconductive particles, said colored toner particles substantially lacking the property of photoconductivity and comprising a colorant selected from the group consisting of a pigment and a dye having a thin layer of a resin absorbed therearound, said photoconductive particles comprising particulate photoconductive material having a thin layer of a resin absorbed therearound, said thin layer of said resin absorbed therearound said particulate photoconductive material being sufficiently thin to facilitate exposure of said particulate photoconductive material and dissipate any charge thereon, said photoconductive particles being present in an amount of from about 5 to about 104 parts by weight for every 100 parts by weight of said colored toner particles;

h. contacting said photoconductive insulating layer with an insulating liquid other than the developer liquid to neutralize any residual charge in the portion of said layer developed in step (g);

i. charging said photoconductive insulating layer;

j. exposing the charged layer to said original colored object through a colored filter to form a third primary color coded electrostatic latent image on said layer; and

k. developing said third electrostatic latent image with a liquid developer having a color complementary to said third color coded image, said liquid developer comprising an insulating liquid having dispersed therein colored particles.

3,971,660

LITHOGRAPHIC PRINTING PLATE COMPRISING HYDROPHILIC LAYER OF POLYVINYLACETATE CROSSLINKED WITH TETRAETHYLORTHOSILICATE

Henry C. Staehle, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 457,733, April 4, 1974, abandoned, which is a continuation-in-part of Ser. No. 289,387, Sept. 15, 1972, abandoned. This application July 17, 1975, Ser. No. 596,873

Int. Cl.² G03F 7/02

U.S. Cl. 96—33 **16 Claims**

1. A lithographic element comprising a support having thereon a layer having a hydrophilic surface, said layer comprising a crosslinked material that is substantially free from discrete particles and comprises hydrolyzed polyvinyl acetate crosslinked with hydrolyzed tetraethylorthosilicate, said element having thereon an image-bearing layer or an image forming layer.

3,971,661

FORMATION OF OPENINGS IN DIELECTRIC SHEET

Frank A. Lindberg, Baltimore; Stephen G. Konsowski, Glen Burnie; Maurice B. Shamash, and Seymour J. Ponemone, both of Randallstown, all of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 262,871, June 14, 1972, abandoned. This application Nov. 14, 1974, Ser. No. 523,946

Int. Cl.² H01L 21/84

U.S. Cl. 96—36.2 **6 Claims**

1. The method of producing in a dielectric sheet at least a first opening in one surface thereof subtended by a metal cover on the opposite surface thereof and at least a second opening in said opposite surface of said sheet subtended by a metal cover on said one surface thereof, said openings being displaced from each other along said sheet, the said method comprising, depositing a coating of metal directly on both said surfaces of said sheet, depositing a photo-resist coating on each of said coatings of metal, producing images respectively on each of said photo-resist coatings, processing said images to remove photo-resist coating from each of said surfaces selectively as determined by said images, the image on the photo-resist coating on said one surface defining the area of said first opening, and the processing of said images exposing to etching only the metal in said last-named area, the image on the photo-resist coating on said opposite surface defining the area of said second opening, and the processing of said images exposing to etching only the metal in said last-named area, the image of said photo-resist coating on said one surface also defining the metal on said one surface which last-named metal subtends said exposed metal on said opposite surface and the processing of said images leaving said subtending metal protected from etching by photo-resist coating, and the image of said photo-resist coating on said opposite surface also defining the metal on said opposite surface which last-named metal subtends said exposed metal on said one surface, and the processing of said images leaving said last-named subtending metal protected from etching by photo-resist coating, subjecting the said imaged and processed sheet as a whole in a single operation to a first etchant to etch both the exposed metal in the area of said first opening and the exposed metal in the area of said second opening, said etchant etching only said last-named metals thereby exposing unetched the dielectric mate-

rials in said areas, said subtending metal on said one surface and said subtending metal on said opposite surface remaining protected against etching respectively by said imaged and processed photo-resist coating on said one surface and by said imaged and processed photo-resist coating on said opposite surface, and, respectively, by said exposed dielectric material in said area on said opposite surface and by said exposed dielectric material in said area in said one surface, etching both said dielectric material in said area on said one surface and said dielectric material in said area on said opposite surface in a single operation with a second etchant to which the metal is resistant and which etches only said last-named dielectric material and removing the residual photo-resist remaining after said imaging and processing from both said surfaces, thereby providing first and second openings respectively in said one surface and said opposite surface, each opening subtended by a metal cover respectively in said opposite surface and said one surface

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3,971,662

SILVER HALIDE COMPLEXING AGENTS OF SULFONES, NITRILES, AND ONIUM SALTS

Arthur H. Herz, and Daniel S. Daniel, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 6, 1974, Ser. No. 503,889
Int. Cl.² G03C 1/48, 5/54
U.S. Cl. 96—76 R 11 Claims

1. In a photographic silver salt, chemical transfer product comprising (a) a photographic element comprising photographic silver halide, (b) a processing composition, and (c) an image receiving layer comprising development nuclei, said product comprising an organic silver halide complexing agent, the improvement wherein said silver halide complexing agent is a carbon acid of the formula:

wherein

CH is a carbon acid moiety with a pKa greater than about 8 and less than about 16,

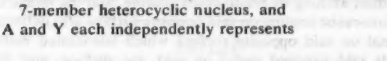
L is H, alkyl containing 1 to 7 carbon atoms or aryl containing 6 12 carbon atoms,

m is 0 or an integer of 1 through 4,

1. when *m* is 1 through 4,

Z taken with A and Y represents atoms completing a 4 to 7-member heterocyclic nucleus, and

A and Y each independently represents

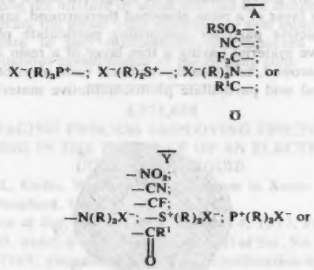


where R is alkyl containing 1–7 carbon atoms,

x^- is an anion;

2. when *m* is zero as in the formula:

A and Y are independently:



where R^1 is R, OR, NH_2 or NR_2, R is alkyl containing 1 through 7 carbon atoms; X^- is an anion.

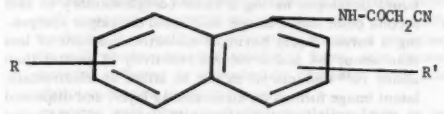
3,971,663

LIGHT-SENSITIVE DIAZOTYPE WITH YELLOW DIAZO COUPLERS

Edward C. Bialczak, 3 Cornfield Lane, Guilford, Conn. 06437

Filed Apr. 11, 1974, Ser. No. 460,130
Int. Cl.² G03C 1/58
U.S. Cl. 96—91 R 4 Claims

1. A light-sensitive diazotype material comprising a base support having an acid stabilized coating thereon which comprises a light-sensitive diazonium compound and a coupling component having the general formula



wherein R is hydrogen, a lower alkyl radical, halogen or aryl, and R' is hydrogen or SO_3M wherein M is a monovalent cation.

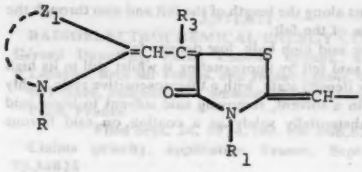
3,971,664

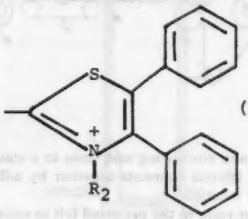
FINE GRAIN SILVER HALIDE EMULSIONS WITH POLYHETERONUCLEAR SENSITIZING DYES

Yoshiyuki Nakazawa; Yasuharu Nakamura; Tohru Sueyoshi, and Akira Sato, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 193,138, Oct. 27, 1971, abandoned.
This application Dec. 2, 1974, Ser. No. 528,597
Claims priority, application Japan, Oct. 27, 1970, 45-94881
Int. Cl.² G03C 1/10, 7/14, 1/02
U.S. Cl. 96—127 7 Claims

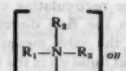
1. In a process for increasing the spectral sensitivity of a fine grain silver halide emulsion to monochromatic light emitted from a neon-helium laser, the numerical average grain size of the silver halide of said fine grain silver halide emulsion being not greater than 0.18 micron in diameter or at least 95% by number of the silver halide particles having particle sizes not greater than 0.2 micron in diameter, the improvement comprising adding to said emulsion a sufficient amount of at least one sensitizing dye represented by the following formula (I)





(X⁻)p (I)

wherein Z_1 represents the group of atoms necessary to form a heterocyclic nucleus selected from the group consisting of a 4,5- diphenyl thiazole nucleus, a benzothiazole nucleus, benzoselenazole nucleus, a naphtho[2,1-d]thiazole nucleus, and a 2-quinoline nucleus, said benzothiazole or benzoselenazole nucleus being substituted by at least one alkoxy group; R and R_1 each represents a lower alkyl group, a hydroxyalkyl group, an alkoxyalkyl group, an acetoxyalkyl group, a carboxyalkyl group, a sulfoalkyl group, an aralkyl group, or an allyl group; R_2 represents an alkyl group, a carboxyalkyl group, a sulfoalkyl group or an aryl group; R_3 represents a hydrogen atom, a lower alkyl group or a carboxyaryl group; X represents an anion; and *p* represents 0 or 1, p being 0 when the compound forms an inner salt; or represented by the following formula:



wherein R_1, R_2, R_3 and R_4 respectively are selected from the group consisting of alkyl radicals and hydroxyalkyl radicals having 1 to 4 carbon atoms; and by being prepared by admixing the quaternary ammonium hydroxide with the silica component before or concurrently with the incorporation of said silica component into said basic refractory raw material.

3,971,665

REFRACTORY COMPOSITIONS

Keiki Suzuki, Onoda; Akitoshi Yoshida, and Shigeki Inoue, both of Funabashi, all of Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

Filed Mar. 18, 1974, Ser. No. 452,376

Int. Cl.² C04B *35/02*

U.S. Cl. 106—58 **9 Claims**

1. A refractory composition by comprising:
   a. 100 parts by weight of a basic refractory raw material selected from the group consisting of oxides and hydroxides of magnesium, calcium, chromium and manganese, and mixtures thereof;
   b. from 0.1 to 200 parts by weight of a silica component selected from the group consisting of silica sol and silicate and mixtures thereof in terms of SiO_2, said silica sol being dispersed in a solvent selected from the group consisting of water and a hydrophilic organic solvent and mixtures thereof and said silicate being selected from the group consisting of lithium, potassium and sodium silicates, ethyl silicate and partially hydrolyzed ethyl silicate: and
   c. from 0.001 to 4 moles of a quaternary ammonium hydroxide per mole of SiO_2 contained in said silica component, said quaternary ammonium hydroxide being expressed by the formula

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3,971,666

PROCESS FOR RECYCLE OF ASPHALT-AGGREGATE COMPOSITIONS

Robert L. Mendenhall, 1770 Industrial Road, Las Vegas, Nev. 89102

Continuation of Ser. No. 286,613, Sept. 5, 1972, abandoned. This application Dec. 30, 1974, Ser. No. 537,562

Int. Cl.² C08L *95/00;* **C09D** *3/24;* **B28C** *1/22;* **G01N** *21/16*

U.S. Cl. 106—281 R **8 Claims**

1. In a process for recycling used asphalt-aggregate composition in an apparatus using hot gas producing means for heating said composition, the improvement comprising:
   a. detecting the asphalt deficiency of said composition, and
   b. mixing and heating said composition without exposure to said hot gas, and adding an amount of make-up asphalt to the composition in response to said detected deficiency while continuing to mix and heat said composition in said apparatus without exposure to said hot gas until substantially homogeneous and to a temperature of at least about 225°F.

3,971,667

INSTALLATION FOR TREATING SUGAR-MILL MOLASSES

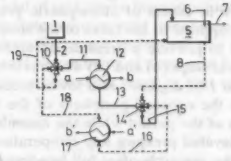
Joseph Emile Albert Blaude, and Georges Francois Michel Frederic Duchateau, both of Tienen, Belgium, assignors to Raffinerie Tirlemontoise, Brussels, Belgium

Filed Mar. 21, 1975, Ser. No. 560,444

Claims priority, application Belgium, Mar. 25, 1974, 812775

Int. Cl.² C13J *1/04*

U.S. Cl. 127—9 **3 Claims**



1. An apparatus for treating sugar-mill molasses, comprising:
   a. a source of diluted molasses,
   b. a tank for reacting the diluted molasses with lime,
   c. first and second heat exchangers,
   d. an inlet line for the tank,
   e. a circuit for recirculating part of the reacted molasses back through the tank, and
   f. valve means having a first position for coupling the source to the inlet line through the first heat exchanger in a first direction and for coupling the second heat exchanger in the recirculating circuit in a first direction, and having a second position for coupling the source to the inlet line through the second heat exchanger in a second direction opposite to the first direction and for coupling the first

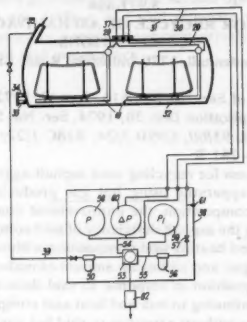
heat exchanger in the recirculating circuit in a second direction opposite to the first direction, whereby the periodic switching of the valve means serves to dissolve deposits and crusts that build up in the heat exchangers.

3,971,668

FORMATION OF LAMINATED GLASS ARTICLES

John Pickard, Studley; Richard Melling, Hollywood, and Arthur Joseph Nobbs, Alvechurch, all of England, assignors to Triplex Safety Glass Company Limited, London, England

Filed Aug. 5, 1974, Ser. No. 494,866
Int. Cl.² B32B *31/20*
U.S. Cl. 156—104 **13 Claims**



1. A method of effecting final bonding between two glass sheets with an interlayer of thermoplastic transparent plastics material between the sheets comprising the steps of:

a. providing an assembly of two glass sheets with an interlayer of thermoplastic transparent plastics material between them;

b. heating the assembly to an elevated temperature sufficient to render said material flowable and maintaining such temperature for a selected period of time;

c. subjecting the major faces of the sheets to a pressure in excess of atmospheric pressure during said selected period of time such that the glass sheets and interlayer become fully bonded together;

d. subjecting the exposed periphery of the interlayer at the edges of the sheets during said selected period of time to a pressure in excess of atmospheric pressure but lower than that applied to the faces of the sheets by an amount sufficient to provide a pressure differential between the pressures of steps (c) and (d) which is in the range of 0.14 Kg/cm^2 to 1.05 Kg/cm^2, said lower pressure being maintained at the exposed periphery of the interlayer for at least part of the period while the assembly is maintained at said elevated pressure and temperature; and

e. cooling the assembly after full bonding has occurred.

3,971,669

CARBON FIBER COMPOSITES

Andrew Peter Wrzesien, Cheadle Hulme; Ian Whitney, Wirksworth, and Joseph Katona, Manchester, all of England, assignors to Hyfil Limited, England

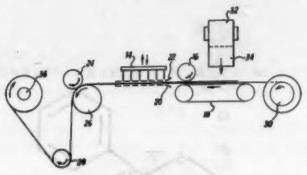
Filed July 17, 1973, Ser. No. 379,913
Claims priority, application United Kingdom, July 21, 1972, 34114/72
Int. Cl.² B29H *9/04*; D04H *3/08*
U.S. Cl. 156—181 **5 Claims**

1. A method of producing a composite shaped article comprising the steps of

preparing a high bulk, low density felt from continuous carbonisable filaments in oxidised state and with fibrous elements lying in cross-over relationship in at least two directions along the length of the felt and also through the thickness of the felt;

carbonising said high bulk, low density felt;

pre-sizing said felt by impregnating it whilst still in its high bulk low density state, with a thermosensitive resin highly diluted in a solvent, removing said solvent to leave said resin substantially solely as a coating on said fibrous



elements, and converting said resin to a state in which it locks said fibrous elements together by adhesion at the cross-over locations;

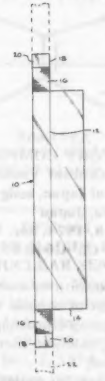
applying further resin to the pre-sized felt to occupy the voids between the adhered fibrous elements, and forming the composite article by converting it into an assembly consisting of a contoured reinforcement constituted by said fibrous elements in a permanent matrix constituted from said resin.

3,971,670

IMPLANTABLE STRUCTURE AND METHOD OF MAKING SAME

Charles A. Homsy, 11526 Raintree Circle, Houston, Tex. 77024

Filed July 17, 1974, Ser. No. 489,453
Int. Cl.² B31F *1/00*
U.S. Cl. 156—196 **12 Claims**



1. The method of forming an elongate implantable structure including the steps of,

heat bonding a flat film onto a flat fabric at temperatures sufficiently low so that the fabric and the film are not weakened on completion of the bonding and remain biocompatible,

folding the composite fabric film structure lengthwise, and

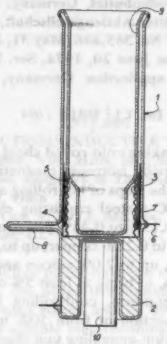
heat forming the folded structure to maintain its elongate configuration.

3,971,671

RADIOELECTROCHEMICAL ENERGY CONVERTER

Gérard Duperray, Paris; Charles Eyraud, Lyon; Gérard Lecayon, Brus sur Forges, and Janine Lenoir, Chaponost, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Sept. 24, 1974, Ser. No. 508,828
Claims priority, application France, Sept. 28, 1973, 73.34825
Int. Cl.² H01M 8/18, 8/20
U.S. Cl. 136—86 R 13 Claims



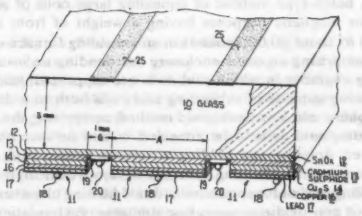
1. A radioelectrochemical energy converter which utilizes the products of radiolysis of an aqueous solution of an oxidation-reduction pair, said converter comprising a leak-tight jacket adapted to be disposed in a cooperative relationship with a source of radiant energy, said jacket being filled with a pure gas which is identical with the gas evolved as a result of said radiolysis, a porous electrode disposed within said jacket and adapted to communicate with said energy source, said electrode being impregnated with said aqueous solution of said oxidation-reduction pair and being specific to the reaction of said oxidation-reduction pair, a gas electrode free from said solution and specific to the gas evolved as a result of said radiolysis, a porous diaphragm for effecting ionic conductivity between said electrodes, and means for connecting said electrodes to an external circuit.

3,971,672

LIGHT DIFFUSER FOR PHOTOVOLTAIC CELL

Curtis M. Lampkin, El Paso, Tex., assignor to D. H. Baldwin Company, Cincinnati, Ohio

Filed Feb. 3, 1975, Ser. No. 546,711
Int. Cl.² H01L 31/04
U.S. Cl. 136—89 5 Claims



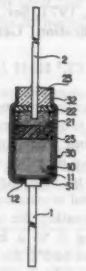
1. A solar cell, including a sheet glass substrate, plural actice photo-sensitive strips coated on one planar surface of said substrate, said active strips being separated by inactive areas and having diffusing surfaces superposed over said inactive areas on the other planar surface of said substrate, whereby radiation passing directly through said substrate to said active strips is undiffused and radiation passing through said diffusing surfaces is refracted in part to said active strips.

3,971,673

ELECTROCHEMICAL CELL WITH FLUID-TIGHT CASING AND METHOD OF CONSTRUCTION

Daniel Coueille, Poitiers, France, assignor to Saft-Societe des Accumulateurs Fixes et de Traction, Romainville, France

Filed June 16, 1975, Ser. No. 586,907
Claims priority, application France, June 28, 1974, 74.22739
Int. Cl.² H01M 2/04
U.S. Cl. 136—133 12 Claims



1. Electrochemical cell having a fluid-tight casing comprising a metal can having a closed bottom and a lateral wall and at least one current output terminal insulated from said can characterized in that said casing comprises additionally a metal sleeve surrounding the lateral wall of the said can, said sleeve being sealingly secured in fluid-tight manner at a first end to the can, and an undeformable electrically insulating seal at *a* second end of said sleeve through which said terminal crosses in a fluid-tight manner, said undeformable seal being of glass and entirely filling and sealing off said second end of said sleeve, and said sleeve being of a material having a coefficient of expansion substantially equal to that of said glass.

3,971,674

SELECTIVE BLACK COATING FOR ALUMINUM

James L. Brandt, Monroeville; William King, Lower Burrell; James Dean Minford, New Kensington, and Clement E. Valchar, Lower Burrell, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Mar. 3, 1975, Ser. No. 554,718
Int. Cl.² C23F 7/06
U.S. Cl. 148—6.27 8 Claims

1. A process for applying to an aluminum surface a selective black coating which is characterized by a high absorptivity in the visible and near infrared wavelengths of 0.38 to 1.9 microns and a low emissivity of infrared wavelengths greater than 6 microns comprising immersing the aluminum for at least 30 minutes in a bath capable of forming said selective black coating, containing at least 200 ppm of a soluble borate salt and a soluble silicate salt at a concentration of at least one-eighth the concentration of the borate salt, said bath having a pH in the range of 8 to 10.

3,971,675

NONFUMING SOLDERING FLUX

Robert C. Thomas, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 286,167, Sept. 5, 1972, abandoned. This application July 1, 1974, Ser. No. 484,526

Int. Cl.[2] B23K *35/34*

U.S. Cl. 148—26 5 Claims

1. A substantially nonfuming solder flux consisting of zinc bromide and an alkali metal bromide selected from the group consisting of sodium, potassium or lithium bromide, wherein the alkali metal bromide is present in an amount from about 50 to about 70 mole percent.

3,971,676

MAGNETIC MATERIAL OF HIGH STRENGTH AND TOUGHNESS

Klaüs Detert, and Hans-Jochen Lipp, both of Neu Isenburg, Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Apr. 19, 1971, Ser. No. 135,370

Claims priority, application Germany, Apr. 17, 1970 2018462

Int. Cl.[2] H01f *1/00*

U.S. Cl. 148—121 7 Claims

1. A method for preparing a magnetic material suitable for use in rotors in hysteresis motors operating at high r.p.m. from a martensitically hardening steel consisting essentially of at least about 65% iron and a member of the group of 8 to 25% Ni, 5 to 20% Cr, and 1 to 10% Mn, said rotor having high stability and toughness and increased coercive field strength, comprising the steps of treating the steel by austenitizing said steel and then subjecting it to a heat treatment including heating the steel to at least 500°C for a time sufficient to yield a coercive force, H_c, of at least 40 oersteds and provide a tensile strength of at least about 150 kiloponds/mm² and a toughness as measured by a reduction in area of at least 15%.

3,971,677

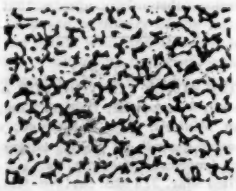
LOW EXPANSION ALLOYS

John Jefferson Mason, Essington, and Peter John Penrice, Birmingham, both of England, assignors to The International Nickel Company, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 507,947, Sept. 20, 1974, abandoned, which is a continuation-in-part of Ser. No. 437,657, Jan. 29, 1974. This application May 5, 1975, Ser. No. 574,587

Int. Cl.[2] C22C *38/08*

U.S. Cl. 148—31 23 Claims



1. A metallic cast article adapted to be employed under stress at temperatures in excess of ambient temperature and having enhanced utility by virtue of dimensional stability over the temperature range from ambient temperature to at least 300°C and high strength and consisting of an alloy having an as-cast and age-hardened microstructure, said microstructure being characterized by a Ni_3Ti precipitate and by substantial segregation of elemental constituents within the as-cast structure but, on the average consisting essentially, in percent by weight, of about 27% to about 47% nickel, about 1% to about 4% uncombined titanium, up to about 16% cobalt, up to about 1.5% niobium, up to about 0.1% carbon, with the balance, except for impurities and incidental elements being essentially iron, to provide in said as-cast plus age-hardened alloy a linear thermal expansion coefficient between 20°C and 300°C of less than about 6×10^{-6}/°C and a 0.2% proof stress at 20°C greater than about 350 N/mm².

3,971,678

METHOD OF MAKING COLD-ROLLED SHEET FOR ELECTRICAL PURPOSES

Constantin Vlad, Wolfenbuttel, Germany, assignor to Stahlwerke Peine-Salzgitter Aktiengesellschaft, Peine, Germany

Continuation of Ser. No. 365,446, May 31, 1973, abandoned. This application June 20, 1974, Ser. No. 481,320

Claims priority, application Germany, May 31, 1972, 2226379

Int. Cl.[2] H01F *1/04*

U.S. Cl. 148—111 6 Claims

1. A method of making cold-rolled sheet for electrical purposes, said sheet having isotropic magnetic properties, said method comprising the steps of hot rolling at a temperature of from 820° to 1080°C a steel consisting essentially of up to 0.1% carbon, from 0.15% to 0.35% manganese, from 0.3% to 2.4% aluminium, up to 0.25% copper, up to 0.05% sulphur, up to 0.2% phosphorus, up to 2.0% silicon and the balance iron except for impurities, to bring at least 5% of the grains into a {100} <hkl>−orientation, cold-rolling said sheet with a reduction in cross section of from 50% to 85% and subsequently recrystallisation-annealing said sheet at a temperature of from 820° to 1200°C. for a time sufficient to yield a product having a grain length at least five times the sheet thickness.

3,971,679

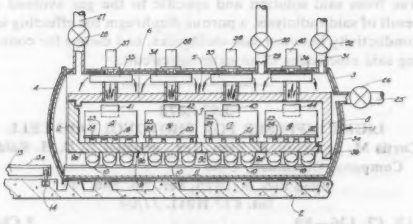
METHOD OF ANNEALING ORIENTED SILICON STEEL

John H. Burger; John R. McClelland, both of Butler, and Robert P. Dunkle, Kittanning, all of Pa., assignors to Armco Steel Corporation, Middletown, Ohio

Filed Sept. 2, 1975, Ser. No. 609,189

Int. Cl.[2] H01F *1/04*

U.S. Cl. 148—113 13 Claims



1. A batch-type method of annealing large coils of silicon steel for magnetic purposes having a weight of from about 30,000 to about 40,000 pounds in an annealing furnace of the type comprising an outer enclosure surrounding an insulated heating chamber in which said coils are supported, said furnace being capable of subjecting said coils both to a desired atmosphere and a vacuum, said method comprising the steps of locating said coils to be annealed in said furnace heating chamber, drawing and holding a vacuum within said outer enclosure and said heating chamber to remove air therefrom, backfilling said outer enclosure and said heating chamber with a desired non-oxidizing annealing atmosphere, circulating said annealing atmosphere through said outer enclosure and said heating chamber, heating said coils to a temperature of about 2200°F. and soaking said coils at said temperature with continued circulation of said annealing atmosphere, cooling said coils in three steps comprising an initial cooling step from

2200°F. (1204°C.) to 1700°F. (927°C.), an intermediate cooling step from 1700°F. (927°C.) to 1225°F. (663°C.) and a final cooling step from 1225°F. (663°C.) to 250°F. (121°C.) with continued circulation of said annealing atmosphere, drawing and holding a vacuum within said outer enclosure and said heating chamber to remove said annealing atmosphere therefrom, backfilling said enclosure and said heating chamber with a gas which will not support combustion in the presence of said annealing atmosphere and removing said coils from said furnace.

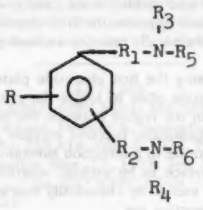
3,971,680
ELECTROCONDUCTIVE PAPER

Charles A. Schneider, Villa Hills, Ky., and William R. Cake, Bay Village, Ohio, assignors to The Sherwin-Williams Company, Cleveland, Ohio

Filed Oct. 9, 1973, Ser. No. 404,549
Int. Cl.[2] B32B *9/06, 21/06*
U.S. Cl. 428—537 **19 Claims**

1. Electroconductive paper having a resistivity of less than about 10^{11} ohm/sq. cm. at relative humidities of about 10% to 90% which comprises paper and an effective amount of a substantially water-soluble electroconductive quaternary ammonium polymer to render the paper electroconductive; said polymer obtained by reacting

a. approximately 0.8 to 1.3 moles of at least one aromatic ditertiary amine having the formula:



wherein R is hydrogen, an alkyl or substituted alkyl radical of 1 to 4 carbon atoms, R_1 and R_2 are the same or different divalent alkyl or substituted-alkyl radicals of 1 Ito 4 carbon atoms and R_3, R_4, R_5 and R_6 are the same or different radicals selected from the group consisting of alkyl and substituted-alkyl radicals of 1 to 4 carbon atoms, and

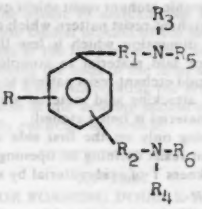
b. about 1.0 mole of at least one anion-containing organic compound having the formula:

$$X\text{-}Y_1\text{-}R_7\text{-}Y_2\text{-}X$$

wherein R_7 is a divalent organic radical having up to 16 carbon atoms selected from the group consisting of alkyl radicals, cycloalkyl radicals, aryl radicals, substituted-alkyl radicals, substituted-cycloalkyl radicals and substituted-aryl radicals, Y_1 and Y_2 are either the same or different divalent alkyl radicals of 1 to 4 carbon atoms and X is an anion bonded directly to an alkyl carbon atom.

12. A process for preparing electroconductive paper having a resistivity of less than 10^{11} ohms/sq. cm. at relative humidities of about 10% to 90% which comprises applying to paper an effective amount of a water-soluble electroconductive quaternary ammonium polymer to render the paper electroconductive; said polymer obtained by reacting

a. approximately 0.8 to 1.3 moles of at least one aromatic ditertiary amine having the formula:



wherein R is hydrogen, an alkyl or substituted-alkyl radical of 1 to 4 carbon atoms, R_1 and R_2 are the same or different divalent alkyl or substituted-alkyl radicals of 1 to 4 carbon atoms and R_3, R_4, R_5 and R_6 are the same or different radicals selected from the group consisting of alkyl and substituted-alkyl radicals of 1 to 4 carbon atoms and

b. about 1.0 mole of at least one anion-containing organic compound having the formula:

$$X\text{-}Y_1\text{-}R_7\text{-}Y_2\text{-}X$$

wherein R_7 is a divalent organic radical having up to 16 carbon atoms selected from the group consisting of alkyl radicals, cycloalkyl radicals, aryl radicals, substituted-alkyl radicals, substituted-cycloalkyl radicals and substituted-aryl radicals, Y_1 and Y_2 are either the same or different divalent alkyl radicals of 1 to 4 carbon atoms and X is an anion bonded directly to an alkyl carbon atom.

3,971,681
COMPOSITE DOUBLE BASE PROPELLANT WITH TRIAMINOGUANIDINIUM AZIDE

William A. Rains; Robert D. Fox, and James P. Flynn, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 24, 1962, Ser. No. 175,382
Int. Cl. C06d *5/06*
U.S. Cl. 149—19.8 **7 Claims**

1. A solid rocket propellant composition which consists essentially of from about:

1. 30–60 weight per cent of a double base propellant
2. 5–30 weight per cent of a finely divided metal fuel
3. 5–30 weight per cent of an inorganic oxidizer
4. 10–30 weight per cent of triaminoguanidinium azide.

3,971,682
ETCHING PROCESS FOR ACCURATELY MAKING SMALL HOLES IN THICK MATERIALS

John J. Frantzen, North St. Paul, and Lee C. Barton, St. Anthony Village, both of Minn., assignors to Buckbee-Mears Company, St. Paul, Minn.

Filed July 11, 1974, Ser. No. 487,665
Int. Cl.[2] C23F *1/02*
U.S. Cl. 156—11 **1 Claim**

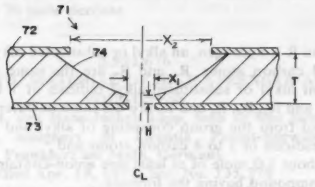
1. A process for making etched openings in a continuous sheet of material whereby the etched openings have a minimum dimension which is less than the thickness of the continuous sheet of material;

forming an etchant resist pattern on opposite sides of a continuous sheet of material having a thickness T, a first etchant resist pattern defining an opening larger than the thickness of the material and a second etchant resist pattern on the opposite side defining an opening having a dimension which is less than 40% of the thickness T of said material;

placing so as to face downward the first side of the continuous sheet of material having etchant resist defining an opening which is larger than the thickness of said material;

applying a removable etchant resist shield over said material and the first etchant resist pattern which defines an opening having a dimension which is less than 40% of the thickness T of said material to completely cover said material and said etchant resist pattern to thereby prevent etchant from attacking said material while the opposite side of said material is being etched;

first spray etching only on the first side of said material having etchant resist defining an opening which is larger than the thickness T of said material by spraying etchant



from below said material until the depth of the etch on the first side of said material produces a region which has a thickness on the order of the minimum dimension of the final opening;

removing the etchant resist shield; and

then simultaneously etching the material from the first and second side of said material to simultaneously remove material from said first and said second sides of said material to thereby produce an opening in said material which has a mimimum dimension which is less than 40% of the thickness T of said material.

3,971,683

METHOD OF ETCHING MATERIALS CONTAINING SILICON

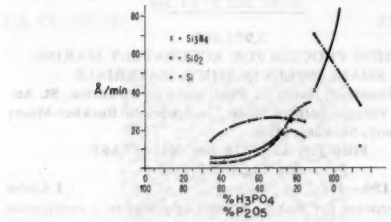
Marian Briska, Boeblingen; Wolfgang Hoffmeister, Gaertringen, and Herbert Kuhlmey, Boeblingen, all of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 21, 1975, Ser. No. 570,068

Claims priority, application Germany, May 28, 1974, 2425684

Int. Cl.² H01L 21/318; C09K 13/04

U.S. Cl. 156—13 **10 Claims**



8. In a method of etching to remove portions of a layer of a first silicon compound in which an etch mask of a second silicon compound is formed on said layer by overcoating said layer with said second silicon compound and removing portions of said second silicon compound to expose the underlying portions of said layer; the improvement which comprises etching said layer with a hot melt consisting essentially of P_2O_5 and anhydrous H_3PO_4 containing from about 12 to 64% by weight of melt of P_2O_5 at a temperature ranging from 160° to 300°C which melt preferentially etches said first silicon compound but which etches said second silicon compound to a degree such that any residual second silicon compound, which was not removed from the portions of said layer to be etched in forming the etch mask, will be removed by the hot melt so that it does not interfere with the complete removal of said layer in the exposed areas.

3,971,684

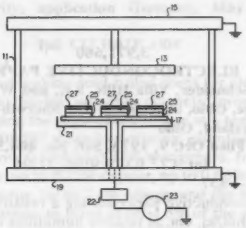
ETCHING THIN FILM CIRCUITS AND SEMICONDUCTOR CHIPS

Steve Yoneo Muto, Cupertino, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 420,990, Dec. 3, 1973, abandoned. This application Apr. 14, 1975, Ser. No. 568,534

Int. Cl.² C09K 13/00

U.S. Cl. 156—13 **6 Claims**



1. A method of etchng a surface comprising the steps of:

positioning the surface to be etched on a first electrode plate;

masking the surface to be etched with an etching mask;

enclosing in a container the first electrode plate, the surface to be etched and etching mask, and a second electrode plate positioned opposite the first electrode plate;

introducing a chemically reactive etchant gas into the container; and

electrically biasing the first electrode plate relative to the second electrode plate to ionize the chemically reactive etchant gas in the region between the two plates and to accelerate chemically reactive etchant gas ions toward the first electrode in a direction substanially perpendicular to the surface to be etched, whereby the surface is directionally etched by chemically reactive ions from the chemically reactive gas.

3,971,685

APPARATUS AND PROCEDURE FOR MANUFACTURING ARTICLES HAVING A NON-WOVEN PILE

Walter Hurtes, 433 W. 34th St., New York, N.Y. 10001

Continuation of Ser. No. 436,640, Jan. 25, 1974, abandoned, which is a continuation-in-part of Ser. No. 229,065, Feb. 24, 1972, abandoned. This application July 31, 1975, Ser. No. 600,601

Int. Cl.² D04H 11/08; D06C 3/00

U.S. Cl. 156—72 **23 Claims**

1. In apparatus for producing a nonwoven pile article, in combination,

a. means for forming separate pile units each comprising a substantially radially symmetrical array of free-ended fibers substantially axially oriented such that ends of the fibers are at the ends of the pile units, and laterally compressed together and separable in maintained relative axial orientation upon release from lateral compression;

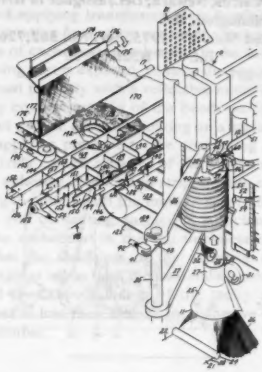
b. means for supporting plural pile units in side-by-side relation;

c. means for successively disposing a plurality of groups of the separate pile units from the forming means in side-by-side relation on said supporting means while maintaining the fibers of each unit laterally compressed together with the fibers of each unit separate from and unconnected to

the fibers of each adjacent unit, each group comprising plural units distributed transversely of the supporting means, said disposing means including means for releasing the fibers of each pile unit from lateral compression upon disposition thereof on said supporting means;

d. means for laterally advancing the released pile units longitudinally of the supporting means while permitting expansion thereof and while applying a force to the released pile units on said supporting means for promoting expansion thereof, by separation of the fibers thereof in maintained relative axial orientation, into contact with adjacent pile units, to produce a continuous, substantially uniform assembly of pile fibers; and

e. means for applying an adherent backing to at least one end of the fibers of the expanded pile units to form a pile article wherein the expanded pile units constitute the pile.



3,971,686

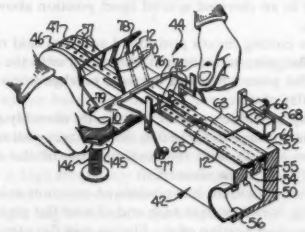
LABEL APPLYING METHOD

Joseph Edward Kienel, Drawer K, Acworth, Ga. 30101

Division of Ser. No. 258,818, June 1, 1972, Pat. No. 3,886,026. This application Mar. 27, 1975, Ser. No. 562,639

Int. Cl.² B29C *17/04*

U.S. Cl. 156—212 **7 Claims**



1. A method for applying a label to an article of merchandise such as men's socks or the like, comprising the steps of:

placing a label upon an endless belt which extends along a path of travel and across a labeling station,

moving the label along the path of travel and to the labeling station by rotating the endless belt and while drawing a partial vacuum below the upper surface of the belt to draw the label into firm engagement with the belt,

holding the label at the labeling station upon its reaching the same by terminating rotation of the endless belt and by maintaining the partial vacuum below the upper surface of the belt,

positioning the article of merchandise transversely across and upon the medial portion of the label while the label is being held at the labeling station, and then

lifting and folding the ends of the label about the article of merchandise while maintaining the article in a relatively fixed position at the labeling station such that the label substantially encircles the article.

3,971,687

METHOD FOR FORMING DOUBLE-WALLED UNITS

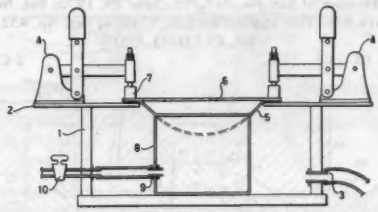
Kent Reaney Greer, Marple Bridge; William Rodney Hampson, Pirton near Hitchin, and Benjamin James Smith, Welwyn Garden City, all of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 490,189, July 19, 1974, abandoned, which is a continuation of Ser. No. 255,637, May 22, 1972, abandoned. This application Aug. 28, 1974, Ser. No. 501,441

Claims priority, application United Kingdom, May 25, 1971, 16870/71; Feb. 17, 1972, 7428/72; July 5, 1974, 29895/74

Int. Cl.² B32B *31/00*

U.S. Cl. 156—221 **9 Claims**



1. A method of forming a double-walled unit comprising the steps of (1) selecting two sheets of an organic thermoplastic material, a first sheet having a perimeter fitting wholly within or matching the perimeter of the second sheet, (2) providing one of the sheets with at least one aperture to allow the passage of air into the space between the sheets so that each sheet can be shaped independently of the other after they have been bonded together about their perimeter, (3) providing means for bonding the two sheets together about their perimeters and heating at least the unapertured sheet to a temperature above the softening point of the thermoplastic, (4) stretching the unapertured sheet relative to the other bonded sheet by means of different pressures acting on each of the sheets to give a desired shape, the control of the shape being effected by the different pressures applied so that the use of moulds is avoided, and (5) allowing the unit to cool below the softening point of the thermoplastic material.

3,971,688

METHOD OF MAKING AN ELONGATE, TRANSVERSELY REINFORCED METAL SHEET

Richard Abbott, Dearborn Heights, Mich., assignor to Fruehauf Corporation, Detroit, Mich.

Filed Dec. 20, 1974, Ser. No. 534,802

Int. Cl.² B32B *15/04*, *15/08*, *31/12*, *7/12*

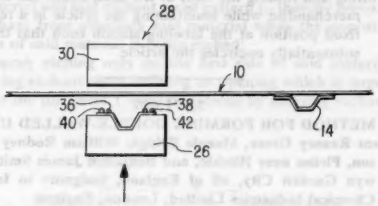
U.S. Cl. 156—295 **6 Claims**

1. The method of making a reinforced metal sheet which comprises the steps of:

a. separately applying a heated, fluid hot melt adhesive and a catalyzed, room temperature curing adhesive in localized side-by-side relation along and within the confines of a bonding surface of a structural member;

b. positioning the structural member of step (*a*) and a metal sheet in spaced registry; and while the hot melt adhesive is fluid,

c. pressing the structural member and the metal sheet together with force sufficient to spread both adhesives out over respectively discrete surface areas cumulatively



covering substantially the entirety of said bonding surface and for a time sufficient to allow said hot melt adhesive to set and bond the sheet and structural member together.

3,971,689

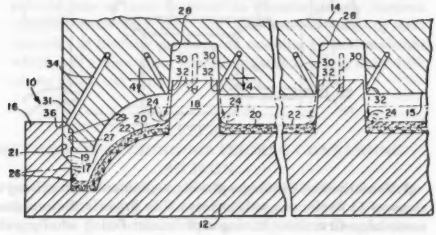
METHOD FOR PRODUCING DECKLE-FREE EDGES AND WINDOWS IN MOLDED FIBER PRODUCTS

William S. Peppler, Chappaqua, N.Y., assignor to Diamond International Corporation, New York, N.Y.

Division of Ser. No. 267,375, June 29, 1972, Pat. No. 3,816,049. This application Jan. 9, 1974, Ser. No. 432,128

Int. Cl.² D21J *3/00*

U.S. Cl. 162—226 **2 Claims**



1. Method of forming deckle-free edges in a molded fiber product comprising the steps of:

a. applying a fiber pulp slurry on a forming mold provided with block-out means whereby edge portions with deckle at base portions of said block-out means will be formed in a preform of the finished product;

b. peeling said deckle from base portions of said block-out means into upstanding position by directing high-pressure fluid such as air and/or steam against said block-out means from a source separate from and external of said forming mold; and

c. pressing said deckle from said upstanding position down against said preform to thereby form the molded fiber product with deckle-free edge portions reinforced with concentrated pressed fibers.

3,971,690

PROCESS FOR ADHESIVE BONDING AND COATING

Hans-Walter Birnkraut, Oberhausen, and Werner Kluy, Bochum-Stiepel, both of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen-Holten, Germany

Filed July 10, 1974, Ser. No. 487,182

Claims priority, application Germany, Jan. 10, 1974, 2400978

Int. Cl.² C09J *3/14*

U.S. Cl. 156—309 **6 Claims**

1. A process for bonding at least two materials together which comprises placing between said materials a lamina comprising a terpolymer containing about 70 to 90 parts by weight of ethylene; about 0.5 to 10 parts by weight of an ethylenically unsaturated carboxylic acid amide, there being only hydrogen on the amide nitrogen and about 0.5 to 20 parts by weight of an ethylenically unsaturated carboxylic acid ester; the sum of said parts by weight being about 100; and heating the terpolymer to a temperature sufficient to cause it to melt, thereby bonding said materials.

3,971,691

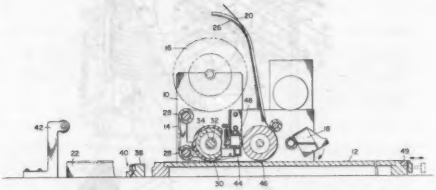
APPARATUS FOR FILM APPLICATION

Michael John Cairns, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Mar. 27, 1975, Ser. No. 562,726

Int. Cl.² B32B *31/00*

U.S. Cl. 156—497 **2 Claims**



1. Film application apparatus for laying film in wrinkle-free fashion on a flat plate comprising:

a flat plate having vacuum channels in the surface thereof, said flat plate having a front end and a rear end;

a carriage reciprocally mounted on said flat plate to traverse said flat plate;

cover film supply roll rotatably connected to said carriage by friction clutch means to provide resistance to rotation of said film to statically and dynamically tension said film;

pressure roller to press said film in contact with said plate;

eccentric means rotatably connecting said pressure roller to said carriage, initial linear motion of said carriage in one direction from said front end to said rear end moving said pressure roller into contact with said film and initial linear motion in the opposite direction moving said pressure roller to an elevated spaced apart position above said flat plate;

hot wire cutting means positioned adjacent said rear end of said flat plate to sever said film rolled onto the surface of said flat plate when said carriage reaches said rear end of said flat plate;

vertically movable vacuum bar means movably connected to said carriage to force film into contact with said cutting means and to hold the trailing edge of the cover film supply roll when severed;

a stationary vacuum bar positioned adjacent said hot wire cutting means at said rear end of said flat plate to retain the severed portion of the film on said flat plate after said vertically movable vacuum bar forces the film into contact with said hot wire cutting means;

air bar means connected to said carriage and interconnected with said vertically movable vacuum bar to release said trailing edge of the cover film supply roll and blow said film toward said flat plate upon initial movement of said carriage in said one direction; and,

means for feeding a liquid photosensitive material onto said film to form a layer of photosensitive material and means for laminating a backing material onto said layer of photosensitive material, said means for feeding liquid and said means for laminating a backing material, both mounted on said carriage and being activated upon return movement of said carriage in said opposite direction.

3,971,692

RETRO-REFLECTIVE MATERIALS

Nigel I. Anderson, Morgenzicht, Sloane St., Witkoppen, Transvaal, South Africa

Filed July 30, 1974, Ser. No. 493,132

Claims priority, application South Africa, July 2, 1974, 74/4273

Int. Cl.² B44C *1/00*

U.S. Cl. 156—241 30 Claims

1. A method of making a retro-reflective body comprising the steps of applying transparent glass beads in a monolayer to a tacky coating formed on a carrier sheet so that a part of the surface of each bead is embedded in the tacky coating and the remaining part is exposed, coating the exposed parts of the beads at least partially with a reflective material, bringing the reflectively coated surfaces of the beads on the carrier sheet into contact with an adhesive coating on a surface of a backing member, applying pressure to the contacting surface so that the reflectively coated surfaces of the beads become embedded in the adhesive coating and stripping the carrier sheet off the backing member, with the improvement, that the pressure applied to the contacting surface is sufficient to cause the beads to be embedded in the full thickness of the adhesive coating, that the thickness of the adhesive coating on the backing member is less than the nominal diameter range of the beads, and that the thickness of the tacky coating on the carrier sheet is less than that of the adhesive coating on the backing member.

3,971,693

PROCESS AND APPARATUS FOR JOINING OBJECTS TOGETHER

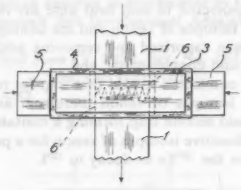
Ib Obel Pedersen, Lerhoj 7, 2880 Bagsvaerd, Denmark

Filed Jan. 22, 1973, Ser. No. 325,236

Claims priority, application Denmark, Jan. 20, 1972, 283/72

Int. Cl.² B29C *27/00*; H05B *7/06*

U.S. Cl. 156—273 3 Claims



1. A process for joining oblong objects having a rectangular cross-section together end to end by means of a cement adapted to be hardened through the action of an electric high-frequency field, said process comprising the steps of placing oblong objects end to end with their joint containing cement between a pair of opposed electrode plates adapted to generate a high-frequency field and with two of their faces parallel to said electrode plates, two other faces of said objects being at right angles thereto, applying a layer of a steam-tight, resilient, electrically insulating material to those areas of said faces parallel to and at right angles to said electrode plates situated within the space comprised between said electrode plates, pressing said layers firmly against said areas to prevent steam and gases from escaping therefrom, and supplying high-frequency electric energy to said electrodes to harden said cement.

3. A device for joining oblong objects of rectangular cross-section together end to end by means of a cement adapted to be hardened through the action of an electric high-frequency field, comprising a pair of opposed, parallel normally spaced electrode plates adapted to be forcibly applied to opposite parallel faces of said objects, said electrode plates being coated on their faces adapted to engage said opposite parallel faces of said objects with a layer of steam-tight, resilient, electrically insulating material, and a pair of opposed slides arranged for sliding movement towards and away from each other between said electrode plates in a direction parallel to said plates, said slides having opposed ends provided with a coating consisting of a steam-tight, resilient, electrically insulating material and adapted to engage another pair of opposed parallel faces of said oblong objects substantially over the width of said faces and along the length of the portions thereof disposed between said electrodes.

3,971,694

MANUFACTURE OF RADIAL-CARCASS TIRES

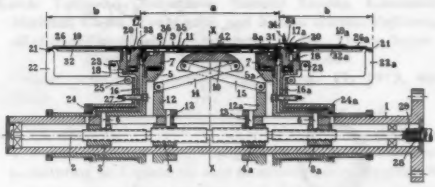
Georges Gazuit, Montlucon, France, assignor to NRM Corporation, Akron, Ohio

Continuation of Ser. No. 28,281, April 22, 1970, abandoned, which is a continuation of Ser. No. 617,658, Feb. 21, 1967, abandoned. This application Apr. 2, 1975, Ser. No. 564,417

Claims priority, application France, Feb. 25, 1966, 66.51107

Int. Cl.² B29H *17/14*, *17/26*

U.S. Cl. 156—415 47 Claims



1. A tire building machine including a drum having a flexible surface adapted to be converted from a generally cylindrical to a toric shape, flange means forming the ends of said drum, said surface including flexible straps extending between said flange means, rigid sectors supporting the center of said straps internally, and means to move said flange means toward each other and said sectors radially outwardly in synchronized fashion to obtain such conversion.

3,971,695

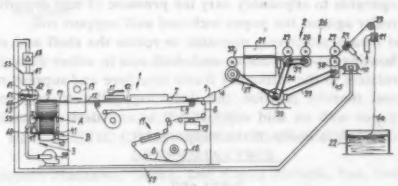
METHOD AND APPARATUS FOR THE PRODUCTION OF FILTER PLUGS

Hans-Jürgen Block, Hamburg, Germany, assignor to Hauni-Werke Korber & Co., KG, Hamburg, Germany

Filed Jan. 19, 1970, Ser. No. 4,018

Int. Cl.² B31F *1/00*

U.S. Cl. 156—461 19 Claims



1. Apparatus for converting a continuous tow of filamentary filter material and a web of wrapping material into filter plugs, comprising advancing means for conveying the tow lengthwise and including stretching means for stretching the filamentary material; wrapping means for applying the web around the thus stretched tow to form a wrapped filter rod; means for subdividing the rod into filter plugs; testing means including means for conveying a gaseous fluid axially through the filter plugs and measuring means for producing signals indicating the resistance of filter plugs to the flow of such fluid; and

control means responsive to said signals for adjusting said stretching means as a function of deviations of measured resistance from a predetermined value.

7. Apparatus for converting a continuous tow of filamentary filter material and a web of wrapping material into filter plugs, comprising advancing means for conveying the tow lengthwise and including stretching means for stretching the tow with an at least substantially constant force and substantially to the elastic limit of said filamentary material; wrapping means for applying the web around the thus stretched tow to form a wrapped filter rod; and means for subdividing the rod into filter plugs.

3,971,696

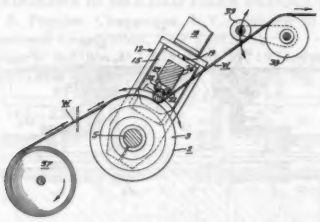
PAPER WEB DECURLING APPARATUS

John L. Manfredi, West Chester, Pa., assignor to The Moore & White Company, Philadelphia, Pa.

Filed Oct. 1, 1975, Ser. No. 618,495

Int. Cl.[2] D21F 7/00

U.S. Cl. 162—271 10 Claims



1. Decurling apparatus for paper webs comprising,

a stationary frame structure

a horizontal shaft rotatably mounted in said stationary support,

a comparatively large diameter support roll rotatably mounted on said rotatable shaft and having a resilient circumferential surface for supporting a paper web drawn from another roll,

a pair of radially extending housings mounted in spaced parallel relation on the shaft adjacent opposite ends of said support roll thereon and fixedly secured on said shaft for rotation therewith,

a relatively small diameter decurling roller rotatably supported in said housings parallel to the support roll and disposed to engage a paper web thereon,

means for urging the decurling roller into pressure engagement with a paper web on the support roll selectively operable to adjustably vary the pressure of said decurling roller against the paper web and said support roll,

and means selectively operable to rotate the shaft and and housings thereon about said shaft axis in either direction relative to the stationary frame structure and support roll and thereby position the decurling roller to engage a paper web on said support roll at any desired location circumferentially of the support roll.

3,971,697

PRODUCTION OF ^{123}I

James W. Blue, Bay Village, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation-in-part of Ser. No. 247,434, April 25, 1972. This application July 12, 1973, Ser. No. 380,046

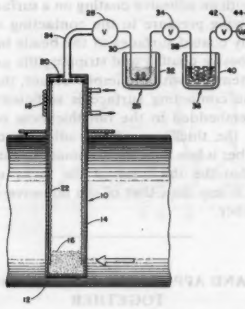
Int. Cl.[2] G21G 1/10

U.S. Cl. 176—11 6 Claims

1. In combination with a high energy accelerator having a duct containing a beam of particles having high energy between 200 MeV and 2000 MeV and current sufficiently high that the total beam power is greater than two kilowatts, apparatus for producing ^{123}I comprising

a heat pipe comprising a tubular container extending into said duct, a portion of said tubular container being in the path of said high energy beam,

a supply of cesium 133 in said portion of said tubular container in said beam, said cesium 133 being bombarded by said beam thereby vaporizing the same and producing radioactive isotopes of xenon including ^{123}Xe and contaminants selected from the group consisting of iodine, tellurium, antimony, tin, indium and cesium by spallation,



cooling means around a portion of said tubular container remote from said portion of said beam for condensing said vaporized cesium,

a first trap connected to said heat pipe for receiving said radioactive isotopes of xenon and the contaminants after the same have vaporized and removing said radioactive isotopes of said contaminants, and

a second trap connected to said first trap for receiving said radioactive isotopes of xenon therefrom and removing the same, said second trap forming a container for holding said radioactive isotopes of xenon for a period of time sufficient for the ^{123}Xe to decay to ^{123}I.

3,971,698

NUCLEAR REACTORS

Paul Heinz Walter Wolff, Rugby, and John Malcolm Peberdy, Huncote, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Aug. 6, 1973, Ser. No. 385,707

Claims priority, application United Kingdom, Aug. 7, 1972, 36815/72

Int. Cl.[2] G21C 3/04

U.S. Cl. 176—43 2 Claims

1. A nuclear reactor having a plurality of upstanding fuel element assemblies closely packed side-by-side to form a core, each fuel element assembly comprising:

a bundle of closely spaced fuel pins,

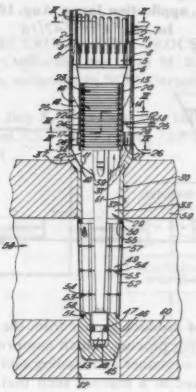
a tubular casing enclosing the bundle of fuel pins,

a tubular lower end fitting for the casing, the end fitting having an inlet port for coolant flow,

a tubular barrier construction extending co-axially within the casing dividing the fuel pins into inner and outer groups, the outer group containing a single row of fuel pins,

a barrier extension extending co-axially within the lower end fitting defining inner and outer coolant flow ducts,

a main gag assembly within the inner duct for restricting flow of coolant over the inner group of fuel pins, and



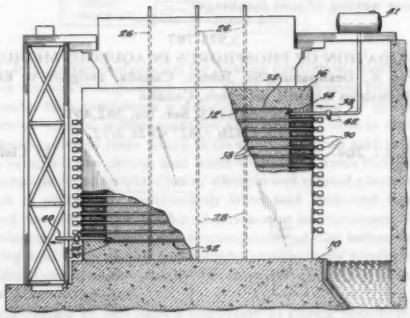
a ported gag ring within the outer duct for restricting flow of coolant over the outer group of fuel pins.

3,971,699

NEUTRONIC REACTOR

Charles W. J. Wende, West Chester, Pa., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed June 19, 1952, Ser. No. 294,349
Int. Cl.² G21C *15/02*
U.S. Cl. 176—52 2 Claims



1. The method of operating a water-cooled neutronic reactor having a graphite moderator which comprises flowing a gaseous mixture of carbon dioxide and helium, in which the helium comprises 40–60 volume per cent of the mixture, in contact with the graphite moderator.

3,971,700

PROCESS FOR THE ENZYMATIC RESOLUTION OF DL-PHENYL GLYCINE AMIDE INTO ITS OPTICALLY ACTIVE ANTIPODES

Wilhelmus H. J. Boesten, Sittard, Netherlands, assignor to Stamicarbon B.V., Geleen, Netherlands

Filed June 5, 1975, Ser. No. 584,197
Claims priority, application Netherlands, June 14, 1974, 7407941
Int. Cl.² C12D *13/06*
U.S. Cl. 195—2 7 Claims

1. A process for preparing D-phenyl glycine amide and L-phenyl glycine, comprising hydrolyzing DL-phenyl glycine amide with an aminopeptidase and isolating D-phenyl glycine amide, L-phenyl glycine, or both by conventional techniques.

3,971,701

METHOD FOR PRODUCING L-GLUTAMIC ACID BY FERMENTATION

Koichi Takinami, Yokohama; Takashi Tanaka, Kawasaki; Michiaki Chiba, Yokohama, and Yoshio Hirose, Fujisawa, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Oct. 7, 1974, Ser. No. 512,480
Claims priority, application Japan, Oct. 17, 1973, 48-116666
Int. Cl.² C12D *13/06;* C12K *1/02;* C12B *1/20*
U.S. Cl. 195—47 5 Claims

1. A method of producing L-glutamic acid which comprises:
a. culturing an L-glutamic acid producing microorganism in an aqueous culture medium until glutamic acid accumulates in said medium,
   1. said medium containing assimilable sources of carbon and nitrogen, inorganic ions and minor organic nutrients necessary for the growth of said microorganisms, a surfactant, and an amount of biotin too great to permit significant production of glutamic acid by the cultured microorganism in the absence of said surfactant,
   2. said microorganism being a mutuant derived from an L-glutamic acid producing parent strain of Brevibacterium,
   3. said mutant being more sensitive to N-palmitoyl-glutamic acid than said parent strain, and
   4. said surfactant being a fatty acid having a straight chain of 6 to 19 carbon atoms, a salt of said fatty acid, an ester of said fatty acid, or an N-acyl-α-amino acid, the acyl group in said N-acyl-α-amino acid being the acyl radical of said fatty acid; and
b. recovering the accumulated glutamic acid from said medium.

3,971,702

DIAGNOSTIC COMPOSITION FOR SACCHARIDE DETERMINATION

Hideyuki Maekawa, Osaka, and Kaoru Ishitobi, Yao, both of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Dec. 27, 1974, Ser. No. 536,867
Claims priority, application Japan, Jan. 9, 1974, 49-5805; Mar. 8, 1974, 49-27298
Int. Cl.² G01N *31/14;* C12K *1/10, 1/04*
U.S. Cl. 195—63 39 Claims

1. A diagnostic composition comprising as a chromogen a diamino-biphenyl derivative having alkyl substituents in the phenyl groups thereof and in which at least one of the hydrogen atoms in either of the amino groups thereof is substituted by at least one lower alkyl group having from one to four carbon atoms and a saccharide oxidase.

3,971,703

METHOD OF DETECTING AND COUNTING BACTERIA

Grace L. Picciolo, Tantallon, and Emmett W. Chappelle, Baltimore, both of Md., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation-in-part of Ser. No. 475,337, May 31, 1974, abandoned. This application Mar. 5, 1975, Ser. No. 555,641

Int. Cl.[2] C12K 1/00

U.S. Cl. 195—103.5 R 19 Claims

1. A method of detecting and counting bacteria in a sample which contains bacterial cells and non-bacterial adenosine triphosphate comprising treating said sample by:

a. removing soluble and non-bacterial adenosine triphosphate;

b. desorbing bound adenosine triphosphate, the desorbed adenosine triphosphate also being removed;

c. rupturing bacterial cells, thereby releasing bacterial adenosine triphosphate;

d. adding a portion of the treated sample to a luciferase-luciferin solution; and

e. measuring the emitted light level.

3,971,704

METHOD AND APPARATUS FOR POLLUTION FREE, DESTRUCTIVELY PROCESSING WASTE

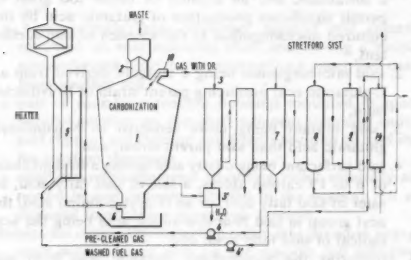
Jürgen von Klenck, Dusseldorf; Erich Michel, Essen, and Klaus-Dieter Gerstenäcker, Dusseldorf, all of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Germany

Filed Sept. 10, 1973, Ser. No. 396,007

Claims priority, application Germany, Sept. 8, 1972, 2244753

Int. Cl.[2] C10B 51/00

U.S. Cl. 201—2.5 18 Claims



1. Method for destructively processing waste comprising the steps of:

feeding the waste into a chamber from above for carbonizing therein under exclusion of air and withdrawing coke adjacent the bottom of the chamber;

separating gas from the upper portion of the chamber and pre-cleaning the separated gas;

heating a portion of the pre-cleaned gas external to the chamber to a temperature sufficient to sustain the carbonization of waste in the chamber as pyrolytic reduction;

feeding said heated portion gas into the chamber below the top thereof for upward passage therein to obtain the carbonization of waste in the chamber in counter flow, whereby the gas mixes with gaseous carbonization products as resulting from the reduction of the waste, to be withdrawn therewith pursuant to said separation step; and

washing that portion of the pre-cleaned gas not fed to the chamber for obtaining the carbonization.

3,971,705

METHOD OF PRODUCING CHAR FROM PULP MANUFACTURING WASTE LIQUOR

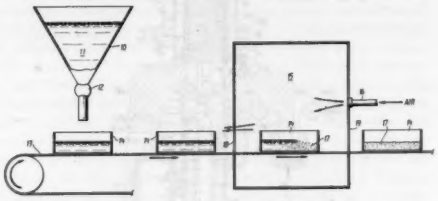
Toshimasa Norita, Tokyo; Hisato Ibara, Kawasaki; Masahiro Murakami, and Masao Okano, both of Tokyo, all of Japan, assignors to Sanyo-Kokusaku Pulp Co., Ltd., Tokyo, Japan

Filed Apr. 17, 1974, Ser. No. 461,643

Claims priority, application Japan, Aug. 10, 1973, 48-89203

Int. Cl.[2] C10B 47/18

U.S. Cl. 201—2.5 4 Claims



1. A method of producing char from the waste liquor of a pulp manufacturing process, which comprises confining said waste liquor in a container and feeding said container into an air heating furnace in a manner such that said container is contacted countercurrently with heated air without rotating or stirring the container, whereby said waste liquor is solidified and carbonized and wherein the carbonizing temperature is 200° to 400°C and the carbonizing time is more than 30 minutes.

3,971,706

METHOD OF REJUVENATING ALKALI-CELL DIAPHRAGMS

Stanley T. Hirozawa, Birmingham, and William K. Langdon, Grosse Ile, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Oct. 1, 1975, Ser. No. 618,451

Int. Cl.[2] C25B 1/16, 1/26

U.S. Cl. 204—98 6 Claims

1. In a process of electrolyzing an aqueous solution of alkali-metal halide in a cell having a porous and hydrophobic diaphragm between the anolyte and catholyte compartments of said cell, the improvement which consists in adding to brine fed to said cell an amount of C_8 to C_{14} glycoside effective to cause wetting of said diaphragm.

3,971,707

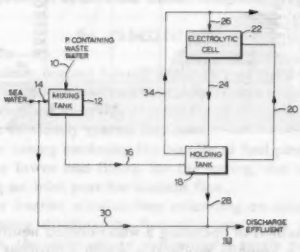
OXIDATION OF PHOSPHORUS IN AQUEOUS MEDIUM

Arun K. Deshpande, St. John's, Canada, assignor to Erco Industries Limited, Islington, Canada

Filed July 25, 1973, Ser. No. 382,491

Int. Cl. C02b 1/82; C02c 5/12

U.S. Cl. 204—149 15 Claims



1. A process for decreasing elemental phosphorus levels in an aqueous medium which comprises subjecting said aqueous

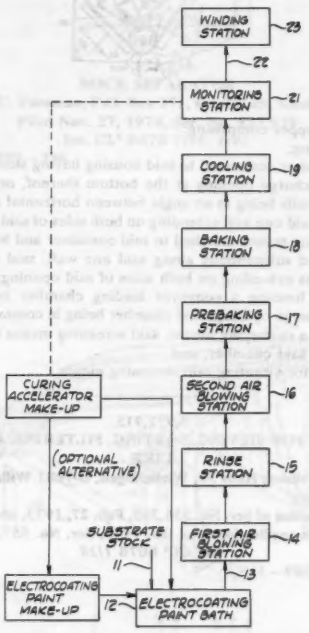
medium containing elemental phosphorus to electrolysis in the substantial absence of electrolytes capable of producing atomic chlorine electrolytically at a pH of about 1 to about 10, whereby said elemental phosphorus is oxidized by anodically produced atomic oxygen.

3,971,708

ELECTROCOATING PROCESS

Gerald G. Davis, Cooksville, and Joan M. Keough, St. Johns, both of Canada, assignors to SCM Corporation, Cleveland, Ohio

Filed July 8, 1971, Ser. No. 160,753
Int. Cl.[2] C25D *13/06, 13/16*
U.S. Cl. 204—181 **12 Claims**



1. In a continuous process for coating continuous electrode stock by electrodeposition of a paint film thereon from an aqueous bath containing a dispersion of cationic or anionic resinous vehicle, a dispersant for said resinous vehicle and a water-dispersible resin which is crosslinkable with said resinous vehicle upon curing, said water-dispersible resin being an aminoplast or phenoplast resin, wherein wet coated electrode stock is withdrawn continuously from said bath and force cured to make finished coated stock, the improvement for regulating flow of the freshly electrodeposited film before and during said force curing and thereby continuously producing finished coated stock virtually free from defects related to said flow which comprises:

establishing in said bath a dispersion of curing accelerator acid codepositable with said resinous vehicle, the pKa of said acid being not substantially above about 1 and the proportion of said acid being about that for yielding a substantially continuous cured film;

monitoring completeness of the resulting coating on the finished coated stock; and,

in response to said monitoring, adjusting concentration of said acid in said bath adequately for maintaining substantially completely coated finished coated stock output.

3,971,709

METHOD FOR FORMING SMOOTH CURED COATED FILMS

Akira Ohsawa, Yokohama; Ryosuke Yamazaki, Kamakura; Osamu Ohe, Tokyo, and Ryoji Okamura, Chigasaki, all of Japan, assignors to Nippon Oils and Fats Company Limited, Tokyo, Japan

Filed Oct. 15, 1974, Ser. No. 514,789
Claims priority, application Japan, Oct. 20, 1973, 48-117393
Int. Cl.[2] C25D *13/06*
U.S. Cl. 204—181 **11 Claims**

1. A method for forming smooth cured coated films, which comprises electrodepositing and coating a film on an electroconductive material in an electrodeposition bath containing a cationically electrodepositing composition, which is composed of a polymer resin having amino groups and at least one of acryloyl groups and methacryloyl groups and of at least one of acrylic acid and methacrylic acid, by using said electroconductive material as a cathode, and curing said coated film by the irradiation of an ionic radiation.

3,971,710

ANODIZED ARTICLES AND PROCESS OF PREPARING SAME

Lubomyr T. Romankiw, Briarcliff Manor, N.Y., assignor to IBM, Armonk, N.Y.

Filed Nov. 29, 1974, Ser. No. 528,318
Int. Cl.[2] C25D *5/02, 11/00*
U.S. Cl. 204—15 **46 Claims**

DIELECTRIC OR SEMICONDUCTIVE LAYER
DEPOSIT ELECTRICALLY CONDUCTIVE LAYER ON DIELECTRIC OR SEMICONDUCTIVE SUBSTRATE
DEPOSIT POROUS METAL OXIDE FORMING LAYER ON CONDUCTIVE LAYER
ANODIZE POROUS METAL OXIDE FORMING LAYER
OXIDIZE CONDUCTIVE LAYER

1. A process for forming anodized porous metal material containing articles which comprises:

A. depositing an electrically conductive layer on a dielectric layer;

B. depositing a porous metal oxide-forming layer on the electrically conductive layer, the porous metal oxide-forming layer being thicker than the electrically conductive layer;

C. anodizing at least a portion of the porous metal oxide-forming layer through the complete thickness of the layer to provide a layer containing porous anodized material;

D. the electrically conductive layer deposited in step (A) constituting a material different from the material deposited in step (B) and having a higher conductivity than said substrate, and the conditions of anodization being such that the material deposited in step (A) acts as a valve metal during the anodizing of the porous metal oxide-forming layer and thickness of said conductive layer being such that it requires a higher potential for its anodization than is required for anodization of the porous metal oxide-forming metallic layer; and then

E. treating said electrically conductive layer to render it nonconductive.

3,971,711

PROCESS FOR INCREASING RADIATION-CURABILITY OF A RADIATION-CURABLE RESIN

Kunio Araki; Takashi Sasaki, and Kazuo Goto, all of Takasaki, Japan, assignors to Nitto Boseki Co. and Japan Atomic Energy Research Institute, Tokyo, both of, Japan

Filed July 31, 1973, Ser. No. 384,366

Claims priority, application Japan, Aug. 4, 1972, 47-77709; Aug. 4, 1972, 47-77710

Int. Cl.² C08F *8/00, 2/54;* C08G *63/02*

U.S. Cl. 204—159.19 **5 Claims**

1. A process for curing an unsaturated polyester resin comprising the steps of:

incorporating in said unsaturated polyester resin from about 50 to about 300 parts by weight, per 100 parts by weight of the resin, of one or more compounds of a finely powdered material of an inactive inorganic compound selected from the group consisting of calcium carbonate, clay, quartz powder, gypsum, cement, mica powder, glass powder, diatomaceous earth, talc, asbestos and red mud of bauxite; and

irradiating the resin containing the compounds with an ionizing radiation applied thereto at a dose rate of 10^{-2} — 2×10^{7} rad/sec for a total dose of 0.1-10 Mrad, and at a starting temperature of from about −20°C to about 60°C,

whereby secondary radiation being emitted from the compounds and/or the compounds activating themselves promote the radiation-curing reaction.

3,971,712

PROCESS FOR REMOVING SULFUR IMPURITIES FROM A FLUID BY CONTACT WITH SILVER ARTICLES

Jaydee W. Miller, Wallingford, Pa., assignor to Pyromet, Inc., Wallingford, Pa.

Continuation-in-part of Ser. Nos. 4,335, Jan. 20, 1970, abandoned, and Ser. No. 93,750, Nov. 30, 1970, abandoned, and Ser. No. 282,029, Aug. 1, 1972, Pat. No. 3,892,562. This application Nov. 29, 1973, Ser. No. 420,224

Int. Cl.² C10G *23/02*

U.S. Cl. 208—208 R **10 Claims**

1. A process for removing sulfur impurities from a fluid comprising flue gas or hydrocarbonaceous substances, said process comprising contacting said fluid with a porous silver article under conversion conditions which cause said sulfur impurity to be removed by said article from said fluid, said porous silver article having a microstructure consisting essentially of a network of inter-connecting cages composed of agglomerates of substantially spherical globules, wherein a substantial number of said spherical globules are visible in said network and wherein said agglomerates are of about uniform size.

3,971,713

PROCESS FOR REMOVING SULFUR FROM CRUDE OIL

Robert D. Ellender, Jr., Star Rte. 2, Box 357, Sulphur, La. 70663

Continuation-in-part of Ser. No. 421,127, Dec. 3, 1973, Pat. No. 3,850,745. This application May 9, 1974, Ser. No. 468,388

Int. Cl.² C10G *19/00*

U.S. Cl. 208—226 **9 Claims**

1. A crude oil desulfurization process which comprises:

a. contacting said crude oil with calcium hydroxide under ambient conditions to form a desulfurized crude oil product and a residue product; and

b. separating said desulfurized crude oil product from said residue product.

3,971,714

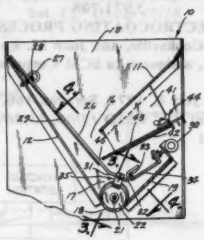
HOPPER SCREENING APPARATUS

Robert D. Jones, and Jerry L. Hall, both of Oskaloosa, Iowa, assignors to Intraco, Inc., Oskaloosa, Iowa

Filed May 19, 1975, Ser. No. 578,535

Int. Cl.² B07B *1/28*

U.S. Cl. 209—257 **15 Claims**



1. A hopper comprising:

a housing;

a container connected to said housing having sidewalls and a discharge opening at the bottom thereof, one of said sidewalls being at an angle between horizontal and vertical, said one wall extending on both sides of said opening;

screening means attached to said container and being positioned substantially along said one wall, said screening means extending on both sides of said opening;

means forming a conveyor loading chamber below said discharge opening, said chamber being in communication with a conveying means, said screening means extending over said chamber; and

means for vibrating said screening means.

3,971,715

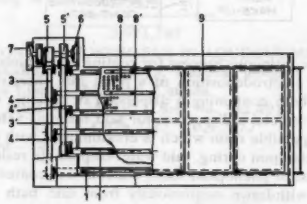
DEVICE FOR SIEVING, SORTING, FILTERING AND THE LIKE

Albert Wehner, Haus 35, Wieladingen, D-7881 Willaringen 2, Germany

Continuation of Ser. No. 336,395, Feb. 27, 1973, abandoned. This application Mar. 10, 1975, Ser. No. 557,091

Int. Cl.² B07B *1/28*

U.S. Cl. 209—310 **7 Claims**



1. A device for sieving, sorting, filtering and the like, said device extending in an inclined manner between a material feed and a material discharge and having a plurality of parallel spaced carriers, means comprising swinging levers and driving rods associated with said carriers and causing said carriers to carry out swinging movements such that the carriers move 180° out of phase with each other, said carriers forming at least two systems extending in a longitudinal direction which is the transporting direction of the material, the movements of carriers of systems located next to each other forming slots of continuously changing width, and at least one mat set covering said slots and fastened to adjacent carriers of two systems, said mat set consisting of at least two spaced and superposed mats,

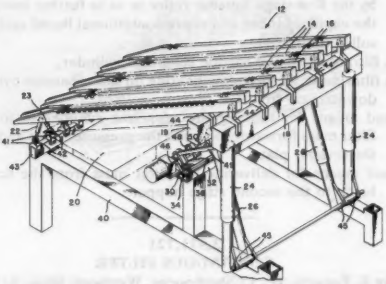
at least one of the mats comprised in a mat set being a perforated mat and at least one mat being an unperforated mat, wherein due to the relative motion of the carriers each mat set forms a sorting zone with a channel-shaped or hose-shaped sorting surface of continuously changing cross-section extending in the longitudinal direction of the carriers, wherein in the closest distance position of the carriers defining one sorting zone one of the two mats has a concave sag and the other of the two mats has simultaneously a convex arching, whereas in the largest distance position of carriers both mats are tightly tensioned, overstretched and parallel relatively to each other, and wherein the transport of the material is effected by the concerted action of the inclined arrangement of the device and the relative motion of the carriers along with the tensioning and release of the mats, whereby said unperforated mats serve as pressure or rebound mats.

3,971,716

ROCK SEPARATOR

Kenneth C. Foreman, P.O. Box 271, Ketchikan, Alaska 99901

Filed Nov. 27, 1974, Ser. No. 527,619
Int. Cl.² B07B 1/16, 1/42
U.S. Cl. 209—396 **5 Claims**



1. A rock separator comprising:
a rigid frame;
a first set of parallel interconnected sorting arms;
a second set of parallel, interconnected sorting arms, the sorting arms in said first set being positioned in alternating spaced relationship with the sorting arms in said second set;
means for supporting said first and second sets of sorting arms on said frame;
a shock absorbing support table mounted on said frame, said support table having a mounting surface fixedly secured to said frame and a shock isolation surface resiliently supported by said mounting surface; and
powered means for imparting a random-like reciprocating motion to first and second drive rods connected to said first and second sets of sorting arms respectively, said powered means being mounted on said isolation surface such that the shock imparted to said frame by said arms is substantially isolated from said powered means.

3,971,717

CONDITIONING HIGHLY RADIOACTIVE SOLIDIFIED WASTE

Werner Hild, Leopoldshafen; Helmut Krause; Knut Scheffler, both of Karlsruhe; Hans Gusten, Speyer; Ernst Gilbert, Karlsruhe, and Rainer Köster, Leopoldshafen, all of Germany, assignors to Gesellschaft fur Kernforschung m.b.H., Karlsruhe, Germany

Continuation of Ser. No. 418,939, Nov. 26, 1973, abandoned.
This application May 27, 1975, Ser. No. 580,962
Claims priority, application Germany, Nov. 24, 1972, 2257737; Sept. 25, 1973, 2348080; Oct. 23, 1973, 2352982
Int. Cl.² B01J 1/10
U.S. Cl. 210—59 **11 Claims**

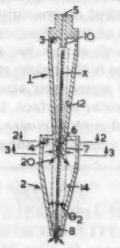
1. A method for conditioning highly radioactive, solidified waste incorporated in a molded glass, ceramic or basaltic body prior to nonpolluting ultimate storage, the method comprising introducing the molded body into waste water, containing a biologically-resistant organic chlorophenol contaminant, from a community or industrial system, introducing a stream of air into said waste water to produce peroxide radicals which attack the chlorophenol and bring about decomposition of the chlorophenol, and maintaining the body in the waste water until the heat output produced by radioactive irradiation from said body is reduced to about one tenth of the amount of heat initially produced by the molded body thereby purifying said waste water.

3,971,718

HYDROCYCLONE SEPARATOR OR CLASSIFIER

Charles M Reid, Calgary, Canada, assignor to Elast-O-Cor Products & Engineering Limited, Calgary, Canada

Filed July 9, 1974, Ser. No. 487,209
Claims priority, application Canada, July 20, 1973, 177018
Int. Cl.² B01D 21/26
U.S. Cl. 210—84 **7 Claims**



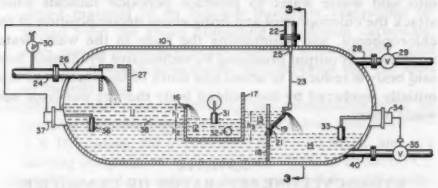
1. A method for the fractionation of the constituents of a liquid suspension, comprising the following steps: introducing the suspension tangentially into a primary vortex chamber having overflow and underflow outlets with a substantial separation of the constituents being effected within said chamber with a portion of the liquid and a major portion of the lighter constituents passing out of the primary overflow outlet and the remainder of the liquid together with heavier constituents and a minor portion of lighter constituents passing out of the underflow of the primary vortex chamber and into the overflow region of a secondary vortex chamber; introducing a washing fluid tangentially into the secondary vortex chamber, at least a portion of said washing fluid and the heavier constituents proceeding out of the underflow of the secondary vortex chamber and at least a portion of the liquid together with lighter constituents which have entered the secondary vortex chamber moving towards the axis of the secondary vortex chamber by virtue of the action of the vortex in the secondary vortex chamber and moving along and around said axis and out of the overflow region of the latter and thence along the axis of the primary vortex chamber together with said portion of said liquid and said major portion of the lighter constituents separated out in the primary vortex chamber and thence

moving together out of the overflow of the latter; and passing at least a portion of the heavier constituents within groove means towards said secondary vortex chamber, said groove means being provided in a wall of the underflow outlet of the primary vortex chamber helically around the axis thereof and extending to the terminal end of the primary underflow for reducing interference between said liquid and heavier constituents passing through the underflow of the primary vortex chamber into the secondary vortex chamber and the oppositely moving liquid and lighter constituents passing from said secondary chamber into said primary vortex chamber.

3,971,719
THREE-PHASE SEPARATOR

Beldon A. Peters, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Dec. 9, 1974, Ser. No. 530,585
Int. Cl.² B01D *15/24*
U.S. Cl. 210—104 **5 Claims**

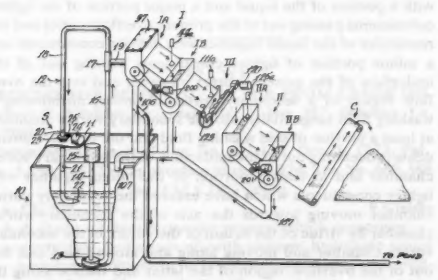


1. In a three-phase oil field separator which includes an emulsion compartment and an oil compartment separated by an oil weir and a water compartment and a water collection compartment separated by a water bulkhead, the improvement comprising a water weir movably mounted on said bulkhead, liquid level control means automatically responsive to changes in the height of the oil-water interface in said emulsion compartment, and means for raising said water weir attendant to a decrease in the height of said oil-water interface and for lowering said water weir attendant to an increase in the height of said oil-water interface, said means being responsive to said liquid level control means so that the height of the oil-water interface is maintained substantially constant.

3,971,720
METHOD OF AND APPARATUS FOR PROCESSING CATTLE EXCREMENT

Roger Swanson, Geneva; Duncan M. Thompson, Riverside, and Robert J. Shulick, St. Charles, all of Ill., assignors to Babson Brothers Company, Oak Brook, Ill.

Filed May 9, 1975, Ser. No. 576,188
Int. Cl.² B01D *37/04*
U.S. Cl. 210—196 **30 Claims**



1. Apparatus for separating from ruminant animal feces the undigested fibrous material that is preponderantly short pieces which consist of bundles of capillary tubes, said apparatus comprising, in combinations:

a supply tank to receive a slurry that contains ruminant animal feces and added liquids including urine;

means in said supply tank for agitating the slurry to make it substantially homogeneous;

a first stage separator to separate the slurry into a filtrate consisting preponderantly of liquid and fine solids, and a filter mass consisting preponderantly of short pieces of fibrous material, said separator including,

a first stage hopper,

a foraminous separator drum which is rotatable on a horizontal axis at the bottom of the hopper,

a squeeze roller surmounting the separator drum slightly downstream of the vertical diameter of said drum,

means urging the squeeze roller against the separator drum with heavy pressure to compress the capillary tubes and express the majority of the liquid therefrom,

a filtrate discharge for the separator drum,

and a filter mass scraper blade bearing on the separator drum downstream from the squeeze roller;

means for pumping the slurry from the tank into the hopper;

and means for rotating the separator drum to force the filter mass forwardly beneath the roller and onto the scraper;

a second stage separator which includes a second stage hopper,

a foraminous separator cylinder which is rotatable on a horizontal axis at the bottom of the second stage hopper,

a pressure roller surmounting the separator cylinder slightly downstream of the vertical diameter of said cylinder,

means urging the pressure roller against the separator cylinder with a pressure several times greater than that exerted by the first stage squeeze roller so as to further compress the capillary tubes and express additional liquid and finer solids therefrom,

a filtrate discharge for the separator cylinder,

a filter mass scraper plate bearing on the separator cylinder downstream from the pressure roller,

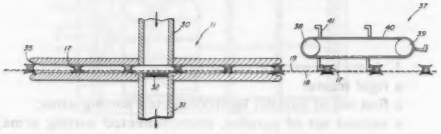
and means for rotating the separator cylinder to force a filter mass forwardly beneath the pressure roller and onto the scraper plate;

and means for delivering the filter mass from the scraper blade to the second stage hopper.

3,971,721
CONTINUOUS FILTER

John E. Fogarty, Jr., 12 Sherbourne, Westboro, Mass. 01581

Filed Dec. 31, 1974, Ser. No. 537,780
Int. Cl.² B01D *33/00*
U.S. Cl. 210—401 **18 Claims**



1. A filter apparatus for pressurized material in flowable form comprising:

a. means for forming a filter zone;

b. pressurized inlet and outlet conduit means for directing a flow of said material through said filter zone;

c. elongated channel means extending transversely in relation to the flow axis of said conduit means, said channel means having first and second aligned channel sections in communication at opposite sides with said filter zone, said channel sections being formed or imperforate walls;

d. an elongated perforate filter web for filtering said material, said filter web being adapted to extend longitudinally through said first channel section, across said filter zone,

and through said second channel section, said filter web having a thickness less than the corresponding internal dimension of said channel sections;

e. means for moving said filter web longitudinally; and

f. a plurality of seal members fixed to and extending across said filter web transversely to the longitudinal axis thereof and spaced at intervals along the length thereof, said seal members having a thickness greater than the thickness of said filter web, said seal members being adapted to cooperate in internal sealing engagement with the imperforate walls of said channel sections, the lengths of said channel sections being greater than the spacing between successive seal members on said filter web.

3,971,722
FILTER ELEMENTS

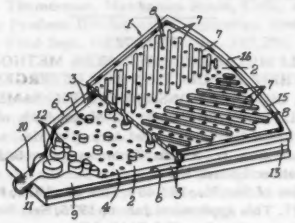
Colin Michael Radford, 14 Sandown Mews, Rivonia Road, Sandown, Sandton, Transvaal, South Africa

Filed Jan. 17, 1975, Ser. No. 542,047

Claims priority, application South Africa, July 17, 1974, 4561

Int. Cl.² B01D *39/00*

U.S. Cl. 210—486 **9 Claims**



1. A filter element comprising a pair of moulded panels secured together to define an internal cavity, a plurality of radially spaced, generally laterally extending supporting ribs on the outer surfaces of the panels, a plurality of drainage perforations between each of a plurality of radially adjacent twos of the ribs and communicating with the cavity and a drainage outlet from said cavity.

3,971,723
GLASS FOR FARADAY ROTATOR ELEMENT

Hidemi Tajima, Tokyo; Yoshiyuki Asahara, Kanagawa, and Tetsuro Izumitani, Tokyo, all of Japan, assignors to Hoya Glass Works, Ltd., Tokyo, Japan

Filed Sept. 12, 1974, Ser. No. 505,292

Claims priority, application Japan, Sept. 12, 1973, 48-102817

Int. Cl.² H01F *1/00*; C03C *3/04*, *3/08*, *3/30*

U.S. Cl. 252—62.51 **3 Claims**

1. In a glass for use as an element of a Faraday rotator, consisting essentially of, by mol%, 10 to 30 Tb_2O_3, 10 to 30 Al_2O_3, 0 to 5 ZrO_2, 0 to 1 Sb_2O_3, 0 to 1 As_2O_3, 0 to 2 AlF_3, SiO_2 and B_2O_3 to give a total of 100 mol%, the improvement being that the glass contains 30 to 80 SiO_2 plus B_2O_3 with the proviso that SiO_2 is more than or is equal to 15 and B_2O_3 is more than or is equal to 10.

3,971,724
DISPLAY DEVICE BACKGROUND COMPONENT COMPOSITION AND METHOD

Ernest L. Fasano, 134 Ninth St., Piscataway, N.J. 08854

Filed Aug. 27, 1974, Ser. No. 501,062

Int. Cl.² H01B *3/00*; G02B *5/23*

U.S. Cl. 252—63.2 **6 Claims**

1. A visual background layer for use in electro-optic display devices, said visual background layer having high dielectric qualities and a black, deep matte surface comprising the calcined mixture of the black higher oxides of iron, cobalt, chromium, and nickel incorporated into a film of dielectric glass.

2. A process of manufacturing a black, deep matte, medium having high dielectric qualities, comprising the steps of:

A. forming an oxide stain mix by

1. combining the following metals or their oxides in the stated proportions

Metal	Metal Oxide	WT/%*
Fe	Fe_3O_4	12–15
Co	Co_3O_4	37–44
Cr	Cr_2O_3	15–18
Ni	Ni_2O_3	2–3

together with the following silicates in the stated proportions

Silicates	WT/%
Ca. SiO_2	8–18
$Al_2O_3.SiO_2$	4–6
$MgO.SiO_2$	2–4

*= calculated as the oxide

2. calcining in air the mixture recited in step (A)(1), above, for from 3 to 5 hours in the temperature range 1200° – 1350°C until the "bisque" state is attained;

3. deagglomerating the calcined mixture;

4. washing the deagglomerated mixture in hot, di-ionized water to remove substantially all water-soluble ionic impurities;

5. drying the washed mixture to remove said de-ionized water; and then

6. grinding the dried mixture to a fine powder;

B. forming a fritted glass mixture by

1. combining the following components in the stated proportions

Oxide	WT/%
SiO_2	53–65
B_2O_3	25–33
Al_2O_3	10–14

2. smelting the combined components recited in step (B)(1), above, for from 2 to 4 hours at a temperature of from 800° – 1200°C;

3. fritting the smelted glass thus produced;

4. ball-milling the fritted smelt to a particle size of less than −325 mesh; and then

5. drying the milled frit for from 3 to 5 hours at a temperature of from 125° – 150°C;

C. forming a pigment by

1. combining the oxide stain mix produced in step (A), above, with the fritted glass mixture produced in step (B), above, in the stated proportions

Element	WT/%
fritted glass mixture	45±5
oxide stain mix	20±3

2. calcining the mixture obtained in step (C)(1), above, for from 1 to 2 hours at a temperature of about 400°C;
3. ball-milling the calcined mixture in an anhydrous purified, non-ionic vehicle with alumina and feldspar, according to the following proportions, until the combined mixture has a particle size of from 5 to 20 microns, preferably 7 to 9 microns

Element	WT/%
Al_2O_3 (Alumina)	20±3
$Ca.Al_2O_2SiO_2$ (Feldspar)	15±2; and then

4. drying the milled mixture for from 5 to 8 hours at a temperature of from 5 to 8 hours; and

D.

1. grinding the pigment set forth in step (C), above, into some suitable vehicle thereby to form the desired black, deep matte, medium.

3,971,725

2-MERCAPTOQUINOXALINE-1-OXIDES, SALTS THEREOF AND 2-(1-OXOQUINOXALINYL) DISULFIDES IN DETERGENT COMPOSITIONS

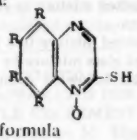
Miriam Lois Douglass, Bound Brook, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 303,778, Nov. 6, 1972, Pat. No. 3,852,443, which is a division of Ser. No. 808,413, Nov. 26, 1969, Pat. No. 3,733,323. This application Jan. 9, 1974, Ser. No. 431,824

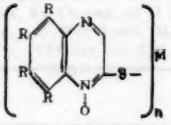
Int. Cl.[2] C11D *3/48, 9/50*

U.S. Cl. 252—106 **6 Claims**

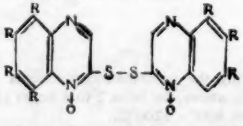
1. A detergent composition which includes an anionic, cationic, nonionic, or amphoteric surface active compound and a fungicidal or bactericidal amount of a compound selected from the group consisting of 2-mercaptoquinoxaline-1-oxides of the formula:



salts thereof of the formula



and disulfides thereof of the formula



wherein R is hydrogen or an alkyl group of 1 to 12 carbon atoms, M is selected from the group consisting of alkali metals, alkaline earth metals, transition element metals, Group III-A metals, Group IV-A metals, Group V-A metals, ammonium and quaternary ammonium, wherein the substituents on the quaternary nitrogen are selected from the group consisting of alkyl groups of 1 to 18 carbon atoms, and arylalkyl groups of 7 to 24 carbon atoms, and *n*, representing the valence of M, is either 1, 2 or 3.

3,971,726

PROCESS FOR LOWERING THE BULK DENSITY OF ALKALI MAKING BUILT SYNTHETIC DETERGENT COMPOSITIONS

Frank R. Smith, Jr., North Plainfield; Edward J. Kenney, Bernardsville, and Walter A. DiSalvo, North Arlington, all of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 298,936, Oct. 19, 1972, abandoned, which is a continuation-in-part of Ser. No. 124,111, March 15, 1971, Pat. No. 3,886,098, which is a continuation-in-part of Ser. No. 203,365, Nov. 30, 1971, abandoned, which is a continuation-in-part of Ser. No. 224,694, Feb. 9, 1972, Pat. No. 3,849,327. This application Apr. 22, 1974, Ser. No. 462,682

Int. Cl.[2] C11D *9/12, 15/04*

U.S. Cl. 252—132 **11 Claims**

1. A method of spray drying alkali metal carbonate beads useful to be post-treated with a polyethoxylated nonionic organic detergent to produce a heavy duty detergent composition, the bulk density of said bead being in the range of about 0.2 to 0.35 gram per milliliter comprising admixing with a 40–75% solids content aqueous crutcher mix containing said alkali metal carbonate from about 0.75 to 4% of an alkali metal soap of a higher fatty acid and up to about 2% by weight nonionic detergent, heating and spray drying the resulting mixture, the carbonate content being approximately 20–75% by weight, and thereafter post-treating said mix with additional amounts of said nonionic detergent such that the final bead contains about 5–15% of said nonionic.

3,971,727

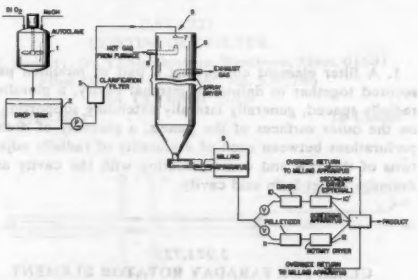
ALKALI METAL POLYSILICATES, METHODS FOR THEIR PRODUCTION AND DETERGENT COMPOSITIONS EMPLOYING SAME

Orlando L. Bertorelli; Robert K. Mays, both of Havre de Grace; Lloyd E. Williams, Bel Air, all of Md., and Howard F. Zimmerman, Jr., Athens, Tenn., assignors to J. M. Huber Corporation, Locust, N.J.

Division of Ser. No. 193,484, Oct. 28, 1971, Pat. No. 3,879,527. This application Jan. 6, 1975, Ser. No. 538,830

Int. Cl.[2] C11D *3/08*

U.S. Cl. 252—135 **1 Claim**



1. A washing composition of a synthetic organic detergent selected from the group consisting of anionic, nonionic, and amphoteric surface active compounds and, as a builder, an alkali metal polysilicate comprising the spray dried and pulverized product obtained by hydrothermally reacting an aqueous mixture of finely divided silica, an alkali metal hydroxide and a sulfate salt of an alkali metal, said hydrothermal treatment comprising conducting the reaction of the aqueous mixture at a temperature in the range of from 280° to 410°F. for a period of at least 2.5 hours, in a closed vessel at pressures of from about 65 psig. to 290 psig., said polysilicate complex having polysilicate ions in a highly polymerized, irreversible state and having a SiO_2/Na_2O weight ratio in the range of from 1.8:1 to 2.7:1; a density in the range of from 30 to 60 pounds

per cubic foot and a moisture content less than 25 percent; said detergent and said builder being present in said washing composition in a weight ratio of from 1:10 to 10:1.

3,971,728

SEQUESTERING AGENT

Gene C. Robinson, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 313,863, Dec. 11, 1972, Pat. No. 3,829,383, which is a continuation-in-part of Ser. No. 262,547, June 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 232,638, March 7, 1972, abandoned. This application May 17, 1974, Ser. No. 470,720

Int. Cl.² C11D 3/20; C02B 5/00

U.S. Cl. 252—180 8 Claims

1. An aqueous solution which contains sequesterable calcium ions or sequesterable magnesium ions or a mixture thereof to which has been added a water soluble salt of a cis-2,5-disubstituted tetrahydrofuran in which the substituents are carboxy groups or carboxymethyl groups in a concentration sufficient to sequester said sequesterable substances which are present in the solution and wherein said solution has a pH above 7.

3,971,729

PREPARATION OF GAS GENERATION GRAIN

Hubert G. Timmerman, Manhattan Beach, Calif., assignor to Specialty Products Development Corporation, Medino, Ohio

Filed Sept. 14, 1973, Ser. No. 397,296

Int. Cl.² C06B 29/08

U.S. Cl. 252—187 R 10 Claims

1. A process for preparing a deflagration gas generation mixture comprising the steps of:

mixing substantially anhydrous nickel formate powder with an oxidizer compound powder;

blending the mixture with a liquid having more water than sufficient to form nickel formate dihydrate;

agglomerating the blended mixture; and

substantially completely dehydrating the agglomerated mixture.

3,971,730

CHLORINATING COMPOSITION OF CHLORINE MONOXIDE IN 1,1,1-TRICHLOROETHANE

Gerald L. Kochanny, Jr.; Thomas A. Chamberlin, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich. Division of Ser. No. 281,475, Aug. 17, 1972, Pat. No. 3,872,176, which is a continuation-in-part of Ser. No. 799,484, Feb. 14, 1969, abandoned. This application Sept. 9, 1974, Ser. No. 504,020

Int. Cl.² C01B 11/02

U.S. Cl. 252—187 R 1 Claim

1. A liquid chlorinating composition comprising chlorine monoxide dissolved in 1,1,1-trichloroethane.

3,971,731

BENZODIFURAN COMPOUNDS

Peter Hartmann, Cologne-Stammheim, and Hans Theidel, Leverkusen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

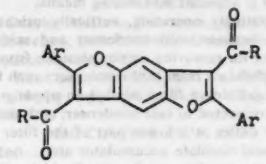
Division of Ser. No. 440,858, Feb. 8, 1974. This application Mar. 20, 1975, Ser. No. 560,185

Claims priority, application Germany, Feb. 9, 1973, 2306515

Int. Cl.² C09K 11/00; D06L 3/12

U.S. Cl. 252—301.32 3 Claims

1. A composition of matter comprising a synthetic fiber forming polymer and an effective amount of an optical brightening benzodifurane compound having the formula



(I)

wherein

R is alkoxy, aralkoxy, aryloxy, cycloalkoxy, hydroxyl, an oxygen atom linked to the radical Ar, or the group

wherein

R_1 and R_2 independently of one another are hydrogen, alkyl, aralkyl or aryl; or

R_1 and R_2 taken together form a saturated carbocyclic or heterocyclic ring; and

Ar is an aromatic-carbocyclic or aromatic-heterocyclic radical.

3,971,732

APPARATUS FOR FIXING RADIOACTIVE WASTE

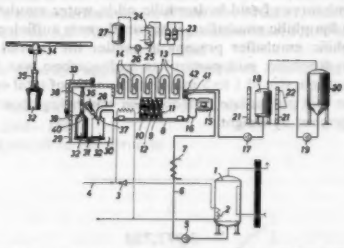
Gerhard Meier, Karlsruhe, Germany, assignor to Gesellschaft fur Kernforschung m.b.H., Karlsruhe and Firma Werner & Pfleiderer, Stuttgart, both of Germany

Filed Dec. 5, 1974, Ser. No. 530,144

Claims priority, application Germany, Dec. 12, 1973, 2361732

Int. Cl.² G21F 9/16

U.S. Cl. 252—301.15 10 Claims



1. In an apparatus for fixing radioactive or toxic waste including an extruder having a mixing chamber; means for feeding the waste and a carrier material to the mixing chamber; means for mixing the waste and the carrier material in the mixing chamber and advancing the mixture therein; means defining a heating zone in said mixing chamber for heating the material therein; a vapor outlet device communicating with the heating zone; an observation window closing off an upper portion of the vapor outlet device remote from the mixing means; a condenser connected after the vapor outlet device; a distillate accumulator connected after the condenser; means defining an extruder outlet through which the mixture is discharged from the extruder; a loading device connected to the extruder outlet for successively charging containers with the mixture emerging from the extruder outlet; the improvement comprising

a. first means disposed in said vapor outlet device for cleaning said observation window;

b. second means disposed in said vapor outlet device for removing deposits from a portion of said vapor outlet device that is adjacent said mixing means;

c. two alternatingly operating, vertically oriented filters connected between said condenser and said distillate accumulator for removing carrier particles from the condensate withdrawn from said condenser; each filter having means defining a filter inlet at an upper part of the filter and connected to said condenser; and means defining a filter outlet at a lower part of the filter and connected to said distillate accumulator and;

d. an interrupter bowl forming part of said loading device and being movably supported adjacent said extruder outlet for receiving the material from said extruder outlet during an exchange of an empty container for a filled container below said extruder outlet.

3,971,733

WATER-WETTABLE WAX COMPOSITION AND PROCESS FOR PRODUCING THE SAME

Edwin Francis Hawkins, Cockeysville, Md., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Dec. 17, 1974, Ser. No. 533,572
Int. Cl.² B01J *13/00*
U.S. Cl. 252—311 11 Claims

1. A textile lubricating water-wettable wax composition consisting essentially of a particulate hydrocarbon wax having a chain length of from about 30 to 55 carbon atoms, a melting point ranging from about 65°C. to about 105°C., and a penetration ranging from about 1 to about 6; about 1 to 10 percent based on the weight of said hydrocarbon wax of a conditioning agent selected from the group consisting of a finely-ground calcium silicate, magnesium silicate, and precipitated ultrafine silica, and an emulsifier selected from the group consisting of:

a. a hydrophilic oil-in-water emulsifier having an HLB of from about 10 to about 20, and

b. mixtures of said hydrophilic oil-in-water emulsifier with a lipophilic emulsifier, wherein there is sufficient hydrophilic emulsifier present to render the overall mixture hydrophilic; said particulate hydrocarbon wax having a particle size of 1 to 5 microns, the ratio of total emulsifier to said particulate hydrocarbon wax being about 3 to 20 percent by weight.

3,971,734

SULFITE COMPOSITIONS, AQUEOUS SULFITE SOLUTIONS AND METHOD OF DECREASING THEIR RATE OF OXIDATION

Harley E. Bush, Houston, Tex., assignor to NL Industries, Inc., New York, N.Y.

Division of Ser. No. 392,344, Aug. 28, 1973, Pat. No. 3,899,293. This application Mar. 3, 1975, Ser. No. 555,070
Int. Cl.² C09K *3/00, 15/32;* C23F *9/00;* C01F *1/00*
U.S. Cl. 252—389 A 18 Claims

1. A sulfite composition which comprises a major proportion of a sulfite compound selected from the group consisting of alkali metal sulfites, alkali metal bisulfites, ammonium sulfite, ammonium bisulfite, and mixtures thereof, and from 1 to 20% by weight, based on the concentration of said sulfite compound, of a stabilizing compound which consists of a water soluble salt of an organic polyphosphonic acid containing at least two phosphonic acid groups per molecule, wherein said composition does not contain any metallic cations which function as catalysts for reacting said sulfite compound with oxygen.

3,971,735

METHANOL PRODUCTION CATALYST AND PROCESS FOR PREPARING THE SAME

Setunobu Asano; Tadashi Nakamura, and Yasuo Yamamoto, all of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Oct. 21, 1974, Ser. No. 516,872
Claims priority, application Japan, Oct. 24, 1973, 48-119764
Int. Cl.² B01J *21/02, 21/04, 23/06, 23/72*
U.S. Cl. 252—432 7 Claims

1. A catalyst suited for the production of methanol which comprises the oxides of copper, zinc, aluminum and boron, wherein the proportion of catalyst components is 30–70% Cu, 15–50% Zn, 1–16% Al and 0.3–5.3% B, all the percentages being expressed by the metal atom ratio.

3,971,736

CATHEPSIN IN D INHIBITORS

Arthur F. Wagner, Princeton, N.J.; Frederick W. Holly, Glenside, Pa.; Tsau-Yen Lin, Piscataway; Tsung-Ying Shen, Westfield, both of N.J., and Ralph F. Hirschmann, Blue Bell, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jan. 21, 1975, Ser. No. 542,884
Int. Cl.² C07C *103/52;* A61K *37/00*
U.S. Cl. 260—112.5 R 10 Claims

1. A compound of the formula:

W-[X-Pro-Phe-Phe-Y-Z]$_n$-H

or pharmaceutically acceptable acid addition salt thereof, wherein

n is 1, 2 or 3; *W* is hydrogen;

an amino acid residue in the D- or L- configuration selected from pyroglutamyl, prolyl, valvyl, or

glycyl;

indole-3-acetyl;

isovaleryl;

dansyl;

D-glucuronyl;

t-butyloxycarbonyl;

cholyl; or 2-deoxy-2-acetamidoglucopyranosyl;

X is D-phenylalanine;

Y is L-proline or L-valine; and

Z is D-leucine, D-tryptophan, D-phenylalanine, D-nor-leucine, D-allo-i-leucine, D-alanine, D-proline or D-valine.

3,971,737

[2-METHYL-Ala^6]LRH

Victor M. Garsky, Havertown, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Mar. 24, 1975, Ser. No. 561,525
Int. Cl.² C07C *103/52;* A61K *37/26*
U.S. Cl. 260—112.5 LH 4 Claims

1. A compound selected from the group consisting of L-p-Glu-L-His-L-Trp-L-Ser-L-Tyr-2-methyl-Ala-L-Leu-L-Arg-L-Pro-Gly-NH_2 and L-p-Glu-L-His(N^{im}-R^4)-L-Trp-L-Ser(R^3)-L-Tyr(R^2)-2-methyl-Ala-L-Leu-L-Arg(N^e-R^1)-L-Pro-Gly-R and non-toxic salts thereof;

wherein;

R is a member selected from the group consisting of —NH_2,—OH, —O(lower)alkyl of 1 to 6 carbon atoms, —O—benzyl,

-NHCH-(polystyrene support resin)

and —OHC_3—(polystyrene support resin);

R^1 is a member selected from the group consisting of —H and a protecting group for the N , N and N nitrogen atoms of arginine selected from nitro, tosyl, benzyloxycarbonyl, adamantyloxycarbonyl and tert-butyloxycarbonyl;

R^2 is selected from the class consisting of hydrogen and a protecting group for the phenolic hydroxyl group of tyrosine selected from tert-butyl, tetrahydropyranyl, trityl, benzyl, 2,6-dichlorobenzyl, benzyloxycarbonyl and 4-bromobenzyloxycarbonyl;

R^3 is selected from the class consisting of hydrogen and a protecting group for the alcoholic hydroxyl group of serine and is selected from acetyl, benzoyl, tetrahydropyranyl, tert-butyl, trityl, 2,6-dichlorobenzyl, benzyl and benzyloxycarbonyl; and

R^4 is selected from the group consisting of hydrogen and a protecting group for the imidazole nitrogen atom of histidine selected from tosyl, benzyl, trityl, 2,4-dinitrothiophenyl, 2,2,2-trifluoro-L-benzyloxycarbonylaminoethyl and 2,2,2-trifluoro-L-butyloxycarbonylaminoethyl.

3,971,738

HEAVY METAL COMPLEXES OF AZO COMPOUNDS CONTAINING A HALOGENO-2,3-DIHYDROXY PYRIDINE COUPLING COMPONENT

Alfred Fasciati, Bottmingen, Switzerland, and Gerhard Back, Loerrach, Germany, assignors to Ciba-Geigy AG, Basel, Switzerland

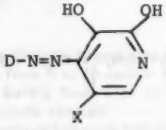
Continuation-in-part of Ser. No. 374,708, June 28, 1973, abandoned, which is a continuation of Ser. No. 136,599, April 22, 1971, abandoned. This application Nov. 14, 1973, Ser. No. 415,578

Claims priority, application Switzerland, Apr. 23, 1970, 6071/70

Int. Cl.² C09B *45/14, 45/24, 45/34*

U.S. Cl. 260—146 R **3 Claims**

1. A 1:1 or 1:2 chromium, cobalt, copper or nickel complex of a dyestuff of the formula



herein

X is fluoro, chloro or bromo,

D is phenyl or napthyl that contains, in the position ortho to the azo bridge; hydroxyl, amino or carboxyl, or if D is phenyl, also methoxy, and where said phenyl is further unsubstituted or substituted by chloro, methoxy, acetylamino, nitro, methyl, acetyl, carbonamido, sulfonamido, methylsulfonyl, sulfo, N-β-hydroxyethylsulfonamido, N-methylsulfonamido, N,N-dimethylsulfonamido, ethylsulfonyl, benzoylamino, β-hydroxyethylsulfonyl, (3′-methoxy, 4′-amino-)-phenyl-, mono- or disulfophenylazo, carboxysulfophenylazo, disulfonaphthylazo, phenylazo, or an acylamino fiber reactive group wherein acyl is chloroacetyl, bromoacetyl, β-chloropropionyl, β-bromopropionyl, α,β-dichloropropionyl, α,β-dibromopropionyl, chloromaleyl, acrylyl, β-chloroacrylyl, β-bromoacrylyl, α-chlorocryly, α-bromoacrylyl, α,β-dibromoacrylyl, trichloroacylyl, chlorocrotonyl or propionyl,

and where said napthyl is further unsubstituted or substituted by sulfo, sulfonamido, nitro, acetylamino or sulfophenylazo.

3,971,739

TRI OR TETRADENTATE METAL AZO PIGMENT COMPLEXES

James McGeachie McCrae, Stewarton, and Christopher Midcalf, Kilbarchan, both of Scotland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

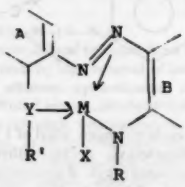
Filed Sept. 20, 1974, Ser. No. 507,643

Claims priority, application United Kingdom, Sept. 22, 1973, 44556/73

Int. Cl.² C09B *45/18, 45/22*

U.S. Cl. 260—151 **6 Claims**

1. A tri- or tetradentate metal complex having the formula



wherein A is an phenyl or naphthyl residue, B is an phenyl or naphthyl residue, R is an alkyl having 1 to 20 carbon atoms or phenyl or biphenyl residue, R′ is a carbon chain, which may form part of a carbocyclic ring, having from 1 to 3 carbon atoms between the X and Y substituents, X and Y are the same or different and each is O or S, and M is a Cu, Zn or Ni metal atom.

3,971,740

MONOAZO COMPOUNDS

Nalin Binduprasad Desai; Ponnusami Jayaraman, both of Goregaon-Bombay, India; Visvanathan Ramanathan, Basel; Klaus Artz, Muttenz, both of Switzerland; Navnitrai Nagarji Naik, Goregaon-Bombay, India, and Walter Jenny, Basel, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

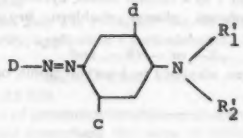
Continuation of Ser. No. 208,468, Dec. 15, 1971, abandoned, which is a continuation-in-part of Ser. No. 806,291, March 11, 1969, Pat. No. 3,679,657. This application Mar. 5, 1974, Ser. No. 448,305

Claims priority, application Switzerland, Mar. 18, 1968, 3958/68

Int. Cl.² C09B *29/08, 29/26, 43/00, 43/12*

U.S. Cl. 260—158 **3 Claims**

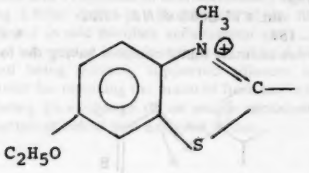
1. A dyestuff of the formula



wherein

D is selected from the group consisting of thiazole-(2)-, 5-nitrothiazole-(2)-, 5-methylsulphonylthiazole-(2)-, 5-cyanothiazole-(2)-, 4-methyl-5-nitrothiazole-(2)-, 4-methylthiazole-(2)-, 4-phenylthiazole-(2)-, 4-(4′-chloro)- phenylthiazole-(2)-, 4-(4′-nitro)- phenylthiazole-(2)-, pyridine-(3)-, quinoline-(3)-, pyrazole-(3)-, 1-phenylpyrazole-(3)-, indazole-(3)-, 1,2,4-thiazole-(3)-, 5-(methyl, ethyl, phenyl or benzyl)-1,2,4-triazole-(3)-, 1-(4′-methoxyphenyl)-pyrazole-(3)-, benzthiazole-(2)-, 6-methylbenzthiazole-(2)-, 6-methoxybenzthiazole-(2)-, 6-chlorobenzthiazole-(2)-, 6-cyanobenzthiazole-(2)-, 6-thiocyanatobenzthiazole-(2)-, 6-nitrobenzthiazole-(2)-, 6-carbethoxybenzthiazole-(2)-, 4- or 6-

methylsulphonylbenzthiazole-(2)-, 1,3,4-thiadiazole-(2)-, 1,3,5-thiadiazole-(2)-, 4-(phenyl or methyl)-1,3,5-thiadiazole-(2)-, 5-phenyl-1,3,4-thiadiazole-(2)-, 3-nitro-5-methylsulphothiophene-(2)-, 3,5-bis(methylsulpho)-thiophene-(2)-, 3-methylisothiazole-(5)-, 4-cyanopyrazole-(2)-, 2-(4′-nitrophenyl)-4-cyanopyrazole-(3)-, phthalimide-(3)-, or



R_1' and R_2' are each hydrogen, alkyl of 1 to 4 carbon atoms, benzyl, β-phenylethyl; β-chloroethyl, β,β,β-trifluoroethyl, β,γ-dichloropropyl, β-cyanoethyl, β-ethoxyethyl, δ-methoxybutyl, β-hydroxyethyl, β,γ-dihydroxypropyl, β-nitroethyl, (β-carbomethoxy)-ethyl, (β-carboethoxy)-ethyl, (β-carbopropoxy)-ethyl, (β-carbomethoxy)-propyl, (γ-carbomethoxy)-propyl, (β-carboethoxy)-propyl, (γ-carboethoxy)-propyl, (β-acetyl)-aminoethyl, (β-formyl)-aminoethyl, β-acetoxyethyl, β,γ-diacetoxypropyl, β-methanesulfonylethyl, β-ethanesulfonylethyl, β-(p-chlorobenzenesulfonyl)-ethyl, β-methylcarbamyloxyethyl, β-phenyl-carbamyloxyethyl, (β-methoxy)-carbonyloxyethyl, (β-ethoxy)-carbonyloxyethyl, (β-isopropoxy)-carbonyloxyethyl, γ-acetamidopropyl, β-(p-nitrophenoxy)-ethyl, β-(p-hydroxyphenoxy)-ethyl, β-(β′-acetylethoxycarbonyl)-ethyl, β-[(β′-cyano)ethoxycarbonyl]-ethyl, β-[(β′-hydroxy) ethoxycarbonyl]-ethyl, β-[(β′-methoxy)ethoxycarbonyl]-ethyl, β-carboxyethyl, β-acetylethyl, γ-aminopropyl, β-diethylaminoethyl, or β-cyanoacetoxyethyl,

d is hydrogen, methyl, ethyl, methoxy, ethoxy, phenylthio or phenoxy,

c is hydrogen, methyl, ethyl, methoxy, ethoxy, phenylthio, phenoxy, chloro, bromo, CF_3—, methylsulfonyl, methylsulfonylamino, ethanesulfonylamino, p-toluenesulfonylamino, phenoxycarbonylamino, methoxycarbonylamino, or aminocarbonylamino, and in which one or two of *c*, *d*, R_1', or R_2' is substituted by a group of the formula

$$—X—CO—N(R)—SO_2—R_2$$

wherein

R_2 is alkyl of 1 to 4 carbon atoms, cyclohexyl, p-tolyl, 2,5-dimethylphenyl, phenyl, 4-chloro, bromo or fluorophenyl,

X is —O—, —S— or —NR—, and

R is hydrogen, alkyl of 1 to 3 carbon atoms, or cyclohexyl.

3,971,741

WATER-INSOLUBLE POLYAZO DYESTUFF COMPRISING TWO OR THREE IDENTICAL AZO DYESTUFFS JOINED TO A CENTRAL NUCLEUS BY CARBOXYL BRIDGES

Georg Dehmel, and Johannes Blahak, both of Cologne-Buchheim, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

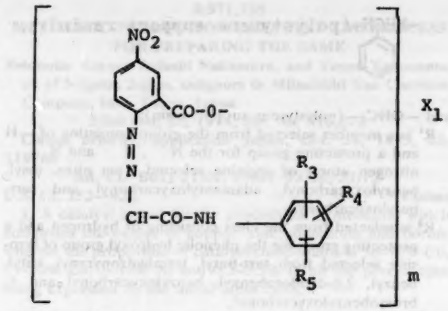
Continuation of Ser. No. 276,027, July 28, 1972, abandoned. This application July 9, 1974, Ser. No. 486,742

Claims priority, application Germany, July 29, 1971, 2138014; Apr. 18, 1972, 2218645

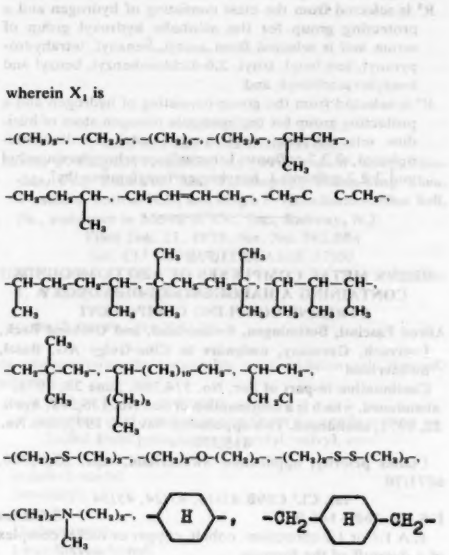
Int. Cl.[2] C09B *35/14, 35/36, 43/12;* D06P *1/10*

U.S. Cl. 260—173 **1 Claim**

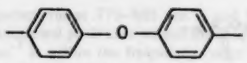
1. Polyazo dyestuff of the formula



wherein X_1 is



phenylene, naphthylene, diphenylene, chloronaphthalene, chlorophenylene, chlorodiphenylene, methylphenylene, methylnaphthalene, methyldiphenylene, or



R_3 and R_4, independently of each other, are hydrogen, alkyl of 1–4 carbon atoms, alkoxy of 1–4 carbon atoms, chloro, bromo, alkylcarbonylamino of 2–5 carbon atoms, alkoxycarbonyl of 2–5 carbon atoms, phenoxy, nitro, cyano, trifluoromethyl, carbamyl, phenylcarbonylamino, phenyloxamido, phenylcarbamyl, or any of said last three radicals which is further substituted by chloro, bromo, alkyl of 1–2 carbon atoms or alkoxy of 1–2 carbon atoms,

R_5 is hydrogen, chloro, bromo, alkyl of 1–2 carbon atoms or alkoxy of 1–2 carbon atoms,

and

m if 2 or 3.

3,971,742
ORGANO-CHALCOGEN COMPOSITIONS

Wolfgang H. H. Gunther, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 210,275, Dec. 20, 1971, Pat. No. 3,905,958, which is a division of Ser. No. 59,495, July 30, 1970, Pat. No. 3,671,467. This application Dec. 13, 1973, Ser. No. 424,496

Int. Cl.² C08G *79/14*

U.S. Cl. 260—2 M **3 Claims**

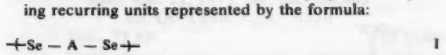
1. A method for controlling the photoresponsiveness of tellurium comprising fusion of intimate mixture of tellurium with at least one compound of the formula:

wherein

R is selected from divalent hydrocarbylene radicals of from 5 to 50 carbon atoms, divalent heterocyclic, alicyclic and aromatic radicals having from 3 to 50 carbon atoms;

n is a positive integer; and

x is the radical —Se—R—Se—; or linear polymers comprising recurring units represented by the formula:



I

wherein

A is selected from the group consisting of divalent alkylene radicals having from 9 to 20 carbon atoms, divalent aromatic radicals having from 6 to 50 carbon atoms and divalent heterocyclic radicals,

the relative weight ratio of tellurium to cyclic diselenide in the intimate mixture ranging from about 1:1 to about 12:1.

3,971,743
EPOXY-AZIDO COMPOUNDS

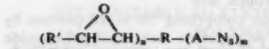
David S. Breslow, Madelyn Gardens, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 448,612, March 6, 1974, Pat. No. 3,941,751, which is a division of Ser. No. 301,003, Oct. 26, 1972, abandoned, which is a division of Ser. No. 85,300, Oct. 29, 1970, abandoned, which is a division of Ser. No. 843,230, July 18, 1969, Pat. No. 3,608,604. This application Feb. 7, 1975, Ser. No. 548,129

Int. Cl.² C08L *15/02*; C07D *303/36*

U.S. Cl. 260—3.3 **1 Claim**

1. A process of cross-linking of polymer which comprises the steps of (1) modifying by heating a polymer selected from hydrocarbon polymers, cellulose esters, cellulose ethers, polyesters, poly(alkylene oxide) polymers, polyamides, allyl pentaerythritol derivatives, poly(vinyl alkyl ethers), poly(vinyl acetals), vinyl chloride polymers, nitrocellulose, chlorinated natural rubber, sulfochlorinated polyethylene, polysulfide rubber, polyurethane rubber, poly(vinyl acetate), ethylene--vinyl acetate copolymers, poly(vinylidene chloride), vinylidene chloride--acrylonitrile copolymers, ethyl acrylate--2-chloroethyl vinyl ether copolymers, poly(ethyl acrylate), poly(ethyl methacrylate), poly[3,3-bis(chloromethyl)oxetane], vinyl modified poly(dimethylsiloxane), polychloroprene, and butadiene--acrylonitrile copolymers in admixture with from about 0.1% to about 20% by weight of an epoxy-azido compound having the formula



where R is an organic radical selected from the group consisting of radicals derived by the removal of two or more hydrogen atoms from alkanes, cycloalkanes, alkylcycloalkanes, arenes, alkyl substituted arenes, alkylenediarylenes, dialkylcycloalkanes, alkyloxyalkanes, aryloxyarenes, alkaryloxyarenes, alkaryloxyalkarenes, aralkyloxyalkanes, aralkyloxyaralkanes, alkylthioalkanes, arylthioarenes, alkarylthioarenes, alkarylthioalkarenes, aralkylthioalkanes, aralkylthioaralkanes, alkylsulfonylalkanes, arylsulfonylarenes, alkarylsulfonylarenes, alkarylsulfonylalkarenes, aralkylsulfonylalkanes, aralkylsulfonylaralkanes, and the foregoing radicals with fluoro, chloro, bromo or iodo substituents, R′ is a radical selected from the group consisting of hydrogen, alkyl, cycloalkyl, aryl, and aralkyl radicals, A is a radical selected from the group consisting of

and —SO_2—and *n* and *m* are integers from 1 to 10 and (2) treating the thus modified polymer with an amount of polyfunctional agent sufficient to insolubilize the product, said polyfunctional agent being selected from the group consisting of polycarboxylic acids and polyamines.

3,971,744
METHOD FOR PREPARATION OF EMULSIONS, CONCENTRATED DISPERSIONS AND PASTES

Slavko Hudecek, and Ivana Gavrilova, both of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Filed July 11, 1974, Ser. No. 487,562

Claims priority, application Czechoslovakia, July 16, 1973, 5087-73

Int. Cl.² C08L *91/00*

U.S. Cl. 260—23 EM **21 Claims**

1. A method of producing emulsions, concentrated dispersions and pastes comprising the steps of initially forming a plasticizing medium by mixing at least one plasticizer with an ingredient selected from the group consisting of fatty acids having more than 12 C atoms, alcohols having more than 8 C atoms and combinations of said fatty acids and alcohols, dissolving in the medium thus obtained 5 to 30 wt.% of a mixture of monomers selected from the group consisting of at least one monomer containing at most two carboxylic groups and a second monomer containing more than one vinyl group, thereafter polymerizing said monomer mixture in said plasticizing medium in the presence of a free-radical initiator for a time sufficient to form a particulate polymer having a maximum particle size of 100 μm and thereafter transforming said polymer into its Na, K or NH_4 salt by contacting the polymer with an aqueous solution of the corresponding hydroxide or carbonate.

3,971,745

AMINO TERMINATED IONIC POLYURETHANE EMULSION WITH POLYEPOXIDE EMULSION

Robert C. Carlson, Hudson, Wis., and Albert H. Stoskopf, Cottage Grove, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 21, 1973, Ser. No. 427,233

Int. Cl.² C08J *3/24;* **C08K** *5/15;* **C08L** *75/08*

U.S. Cl. 260—29.2 TN **4 Claims**

1. An aqueous emulsion comprising a blend of

a. polyurethane emulsion comprising 10 to 70 percent by weight internally emulsified, ionic polyurethane polymer containing terminal amino groups, and

b. polyepoxide emulsion comprising 10 to 70 percent by weight polyglycidylether polyepoxide resin, said polyepoxide resin being present in an amount of 1 to 10 percent by weight, based on the combined weight of the polyurethane and polyepoxide resin solids, said aqueous emulsion having a suitable pH and said amount of said polyepoxide resin and said pH being such as to provide a dry film from said aqueous emulsion having improved wet strength.

3,971,746

SYNTHETIC POLYISOPRENE RUBBER LATEX

Koji Hirai; Takayuki Okamura, and Kiyoshi Fujii, all of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Mar. 28, 1975, Ser. No. 562,876

Claims priority, application Japan, Mar. 29, 1974, 49-36145; Nov. 29, 1974, 49-137878

Int. Cl.² C08L *9/10*

U.S. Cl. 260—29.7 D **27 Claims**

1. A polyisoprene rubber latex derived from synthetic cis-1,4-polyisoprene rubber and comprised of a stable aqueous dispersion of a modified polyisoprene rubber comprising of a carboxylated polyisoprene rubber with from about 0.03 to 20 carboxy groups per 100 recurring units of isoprene monomer in said cis-1,4-polyisoprene rubber said stable aqueous dispersion of modified polyisoprene rubber being obtained from an oil-in-water emulsion comprised of between about 4% to 20% by weight organic solvent solution of said modified polyisoprene rubber, an emulsifying agent and water after removal of said organic solvent from said emulsion.

3,971,747

CURABLE COMPOSITIONS

Howard M. Bank, Freeland, and Keith W. Michael, Midland, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Apr. 11, 1975, Ser. No. 567,148

Int. Cl.² C08L *83/00, 63/00*

U.S. Cl. 260—37 SB **36 Claims**

1. A method of preparing compositions containing silicon-oxygen-carbon bonds comprising reacting under substantially anhydrous conditions

A. an organosilicon compound containing at least one SiOH group with

B. a compound containing at least one epoxy group, said reaction being carried out in the presence of a catalytic amount of

C. an aluminum compound selected from the group consisting of

a. $al(OR)_2$ in which R is either a hydrogen atom or selected from the group consisting of alkyl radicals contaning from 1 to 20 inclusive carbon atoms or aryl and aryl-containing hydrocarbon radicals containing from 6 to 24 inclusive carbon atoms;

(b) $Al(OR)_a(OCR')_{3-a}$ (with $\overset{O}{\overset{\|}{}}$ above the OCR′)

in which R is as previously defined, R′ is selected from the group consisting of the hydrogen atom, alkyl radicals containing from 1 to 30 inclusive carbon atoms and aryl or aryl-containing radicals of at least 6 carbon atoms, *n* having a value of from 0 to 2 and condensates of such compounds;

c. aluminum salts of the formula

$H^+ Al^-(OR)_4$

in which R is as previously defined;

d. aluminosiloxy compounds of the formula

$=ALOSIR_2^2$

in which R^2 is selected from the group consisting of —OR radicals in which R is as defined,

$-OCR'$ (with $\overset{O}{\overset{\|}{}}$ above)

radicals in which R′ is as defined, monovalent hydrocarbon or halohydrocarbon radicals containing from 1 to 30 inclusive carbon atoms, and siloxane moieties of the formula

$-OSiO_{3-a}$ (with R^2_a below)

in which R^2 is selected from the group consisting of OR radicals in which R is as defined,

$-OCR'$ (with $\overset{O}{\overset{\|}{}}$ above)

radicals in which R′ is as defined and monovalent hydrocarbon or halohydrocarbon radicals containing from 1 to 30 inclusive carbon atoms, and *a* has a value of from 1 to 3; The remaining aluminum valences being satisfied by —OAl=, —OR,

$-OCR'$ (with $\overset{O}{\overset{\|}{}}$ above)

or $—OSIR_3^2$ bonding, R, R′ and R^2 being as previously defined; and

e. aluminum chelates formed by reacting compounds (a), (b) or (c) with sequestering agents in which the coordinating atoms are oxygen.

3,971,748

GRAPHITE POWDER-POLYPHENYLENE MIXTURES AND COMPOSITES

Chen-Shen Wang, Naperville, and Eli W. Blaha, Wheaton, both of Ill., assignors to Standard Oil Company, Chicago, Ill.

Filed Oct. 7, 1975, Ser. No. 620,317

Int. Cl.² C08L *65/02*

U.S. Cl. 260—37 R **10 Claims**

1. A moldable resin mixture comprising:

a. about 25 to 95% graphite powder;

b. about 5 to 75% branched polyphenylene comprising benzene ring structures bonded into a polymer chain wherein the linear infrared absorbance spectrum integrated peak area within the frequency range 726–930 cm^{-1} is distributed as follows: from 10 to 18% of the integrated peak area is within the frequency range 854–930 cm^{-1}, from 15 to 30% is within the frequency range 850–853 cm^{-1}, from 13 to 20% is within the fre-

quency range 778–805 cm^{-1}, and the remainder of the integrated peak area within the frequency range 726–930 cm^{-1} is within the frequency range 726–777 cm^{-1}; and

c. 0 to about 30% branched nitropolyphenylene comprising benzene ring structures bonded into a polymer chain and from 0.25 to 15 percent by weight of nitrogen wherein infrared absorbance occurs at frequencies of about 1345 cm^{-1} and about 1525 cm^{-1} and at least 8% of the linear infrared absorbance spectrum integrated peak area within the frequency range 726–930 cm^{-1} is within the frequency range 856–930 cm^{-1}.

3,971,749

METHOD OF PREPARING SMALL PARTICLES OF POLYPROPYLENE

Harry W. Blunt, Hockessin, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 454,990, March 26, 1974, abandoned. This application July 7, 1975, Ser. No. 594,149

Int. Cl.² C08K *5/01, 5/02, 5/05*

U.S. Cl. 260—33.4 PQ **5 Claims**

1. A method of preparing a dispersion of polypropylene in the form of discrete substantially spherical particles of about 1 to 100 microns in diameter which comprises preparing a homogeneous solution of about 10 to 25% concentration by weight of polypropylene at an elevated temperature in a normally liquid organic material which is a solvent for polypropylene at a temperature of at least 120°C. and which has a solubility parameter of about 6.6 to 10.3 $(Cal/cc)^{1/2}$, a dipole moment of about 0 to 1.7 Debye units and a hydrogen bonding parameter of about 0 to 18.7 $cm.^{-1}$, thereafter cooling said solution to room temperature under quiescent conditions to precipitate the polypropylene, subjecting the precipitated polymer to high shear conditions and recovering a dispersion of particles in the organic liquid.

3,971,750

FIRE RESISTANT EPOXY RESINS CURED WITH PHOSPHORUS TRIHALIDES

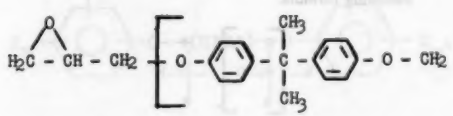
Kevin M. Foley, Hebron; Reuben H. Bell, Cincinnati, and Frank P. McCombs, Granville, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

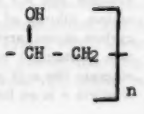
Filed Apr. 21, 1975, Ser. No. 569,905

Int. Cl.² C08G *51/10, 30/10*

U.S. Cl. 260—37 EP **18 Claims**

1. A curable epoxy system consisting essentially of an uncured epoxy resin and a hardening agent of phosphorus trihalide wherein the uncured epoxy resin is represented by the structure:





wherein *n* ranges from essentially zero to about 30 and wherein the uncured epoxy resin and hardening agent have a ratio of epoxy equivalent weight to halogen equivalent weight ranging from 3:1 to 1:3.

3,971,751

VULCANIZABLE SILYLETHER TERMINATED POLYMER

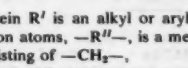
Katsuhiko Isayama, and Itaru Hatano, both of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed June 9, 1975, Ser. No. 584,827

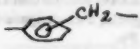
Int. Cl.² C08L *83/00, 71/00*

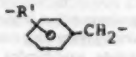
U.S. Cl. 260—37 R **20 Claims**

1. A composition comprising a polyether consisting essentially of chemically combined units of the formula $—R'''—O—$, having a molecular weight of between 500 to 15,000, and terminal silylether groups of the formula



wherein R' is an alkyl or aryl radical having from 1 to 12 carbon atoms, $—R''—$, is a member selected from the group consisting of $—CH_2—$,





and $—R'—OCH_2—$, wherein R' is a divalent hydrocarbon radical having 1 to 12 carbon atoms and selected from the group consisting of alkylene radicals, cycloalkylene radicals, arylene radicals and aralkylene radicals; —R— is a divalent alkylene radical selected from the group consisting of $—CH_2CH_2—$,

and $—CH_2CH_2CH_2CH_2—$, X is a member selected from the class consisting of halogen radicals, alkoxy radicals, acyloxy radicals, ketoximato radicals, amino radicals, amide radicals and mercaptide radicals; *a* is a whole number equal to 0, 1 or 2 and *b* is a whole number equal to 0 to 1.

3,971,752

FLAME RETARDING POLYESTER COMPOSITION

Toshikazu Aoyama, Nagoya; Yukinori Kimata, Gifu; Hotuma Okasaka, Nagoya; Hiroshi Kodama, Nagoya, and Naoya Yoda, Nagoya, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Dec. 23, 1974, Ser. No. 535,952

Claims priority, application Japan, Dec. 26, 1973, 49-144066

Int. Cl.² C08K *3/22, 5/03, 5/06*

U.S. Cl. 260—40 R **5 Claims**

1. A flame retarding thermoplastic polyester composition reinforced by glass fiber which comprises 100 parts by weight

of a glass fiber reinforced thermoplastic polyester, 2 to 19 parts by weight of at least one flame retarding agent selected from the group consisting of decabromodiphenylether and decabromodiphenyl, and 12 to 30 parts by weight of antimony trioxide, wherein the ratio by weight of bromine atom to antimony atom is within the range of 0.15 to 0.27, wherein the glass fiber reinforced thermoplastic polyester comprises 98 to 40 parts by weight of thermoplastic polyester and 2 to 60 parts by weight of glass fiber.

3,971,753

POLYMER COMPOSITES AND PREPARATION THEREOF

Arthur C. Frechtling, Watchung; Norman W. Johnston, East Windsor, and Richard G. Shaw, Asbury, all of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 13, 1973, Ser. No. 424,281

Int. Cl.² C08K *9/04, 9/10*

U.S. Cl. 260—42.14 **23 Claims**

1. A composite comprising a filler substrate, an organic free radical polymerization initiator, which has been decomposed into free radicals, containing carboxyl or carboxamide groups, said initiator bonded through said groups to said substrate and ethylenically unsaturated monomer which has been polymerized to a resin matrix by said initiator free radicals.

3,971,754

X-RAY OPAQUE, ENAMEL-MATCHING DENTAL FILLING COMPOSITION

Anton Jurecic, Springfield, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Dec. 10, 1973, Ser. No. 423,329

Int. Cl.² A61K *5/06;* **C08K** *3/40, 9/06;* **C08L** *33/12*

U.S. Cl. 260—42.15 **7 Claims**

1. In a dental filling composition having a binder resin made of condensation products from the reaction of bisphenol A with glycidyl methacrylate, said binder being in the presence of a diluent and intermixed with a fused glass filler in finely divided particulate form containing 25 to 50 weight percent SiO_2 and a sufficient amount of fluxing agent to bring the fusion temperature below 1350°C, the improvement comprising said glass filler including, at the time of fusing thereof, about 5 to 60 percent by weight of a compound selected from the class consisting of oxides and carbonates of lanthanum, hafnium, strontium and tantalum, to provide a non-toxic, x-ray opaque and optically translucent restorative matrix resistant to oral fluids.

3,971,755

POLYMER COMPOSITIONS CONTAINING TITANIUM DIOXIDE HAVING IMPROVED VISIBLE AND ULTRAVIOLET LIGHT STABILITY

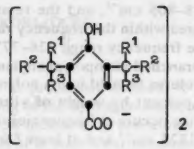
Joseph Salvatore Zannucci, and Gerald Ray Lappin, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 2, 1974, Ser. No. 511,401

Int. Cl.² C08K *3/22, 3/24*

U.S. Cl. 260—42.45 **3 Claims**

1. An ultraviolet light stabilized pigmented polymeric composition comprising (1) a polymeric composition normally susceptible to degradation due to visible or ultraviolet light selected from the group consisting of polypropylene and polypropylene containing graft reacted acrylic acid, (2) titanium dioxide and (3) as the ultraviolet stabilizer about 0.01 to 5 weight percent of a zinc salt of a compound having the formula



wherein R^1, R^2 and R^3 are the same or different and each represents an alkyl group having 1 to 8 carbon atoms; and X^{+2} is Zn^{+2}.

3,971,756

FLAME RETARDANT POLYCARBONATE COMPOSITION

Charles A. Bialous, Evansville; John B. Luce, Mount Vernon, and Victor Mark, Evansville, all of Ind., assignors to General Electric Company, Pittsfield, Mass.

Filed Aug. 9, 1974, Ser. No. 496,115

Int. Cl.² C08K *5/42;* **C08L** *69/00*

U.S. Cl. 260—45.7 R **4 Claims**

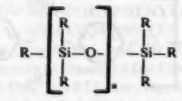
1. A flame retardant polycarbonate composition comprising:

a. an aromatic carbonate polymer in admixture with

b. an organic alkali metal salt or an organic alkaline earth metal salt of an acid selected from the group consisting of:

monomeric or polymeric aromatic sulfonesulfonic acids,
sulfonic acids of aromatic ketones,
heterocyclic sulfonic acids,
halogenated non-aromatic carboxylic acids,
sulfonic acids of aromatic sulfides,
monomeric or polymeric aromatic ether sulfonic acids,
aliphatic and olefinic sulfonic acids,
monomeric or polymeric phenol ester sulfonic acids,
unsubstituted or halogenated oxocarbon acids,
sulfonic acids of monomeric and polymeric aromatic carboxylic acids and esters,
halocycloaliphatic aromatic sulfonic acids,
monomeric or polymeric aromatic amide sulfonic acids,
monomeric or polymeric aromatic sulfonic acids,
of mixtures thereof, and

c. a siloxane in sufficient quantity to render the polycarbonate composition non-dripping; said siloxane being of the following formula:



wherein the R's are independently selected from the group consisting of hydrogen, hydroxy, alkyl of from 1 to 6 carbon atoms, alkoxy of from 1 to 6 carbon atoms, alkenyl from 2 to 8 carbon atoms; alkynyl from 2 to 10 carbon atoms, aryl from 6 to 18 carbon atoms, aryloxy from 6 to 10 carbon atoms and wherein the R's may be substituted by halogen, hydroxy, amino, alkoxy of 1 to 6 carbon atoms, aryloxy of 6 to 10 carbon atoms, arylthio and alkylamino wherein the alkyl portion contains 1 to 6 carbon atoms, arythio and arylamino wherein the aryl portion contains 6 to 10 carbon atoms and wherein *n* is an integer having a value of one or more.

3,971,757

3-ALKYL-4-OXO-IMIDAZOLIDINES AND THEIR 1-OXYLS

Michael Rasberger, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

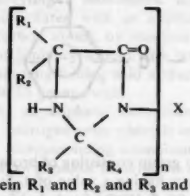
Filed June 5, 1974, Ser. No. 476,365

Claims priority, application Switzerland, June 22, 1973, 9185/73

Int. Cl.² C08K *5/00*; C07D *49/34*

U.S. Cl. 260—45.8 N 12 Claims

1. Compounds of the formula



wherein R_1 and R_2 and R_3 and R_4, together with the carbon atoms to which they are bonded, form cycloalkyl radicals, *n* is an integer of 1 or 2, and X, if *n* is 1, is an alkyl group of 8 to 18 carbon atoms, allyl, methallyl, propargyl or benzyl group, and if *n* is 2, an alkylene group with 2 to 4 carbon atoms or alkylene with 2 to 10 carbon atoms which is interrupted by ester groups.

3,971,758

PLASTIC COMPOSITIONS CONTAINING ACRYLONITRILE-BUTADIENE-STYRENE POLYMER AND A BIS-PHENOXY FLAME RETARDANT

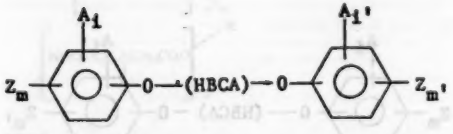
Arnold L. Anderson, and Robert J. Nulph, both of Alma, Mich., assignors to Michigan Chemical Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 260,240, June 6, 1972, abandoned. This application Feb. 8, 1973, Ser. No. 330,819

Int. Cl.² C08K *5/05*

U.S. Cl. 260—45.9 KA 14 Claims

1. A plastic composition consisting essentially of acrylonitrile-butadiene-styrene polymer having incorporated therein an effective amount of a flame retardant which is a compound having the formula:



wherein Z is selected from the group consisting of bromine or chlorine; *m* and *m'* are integers having a value of 1–5; *i* and *i'* are integers having a value of 0–2; HBCA is a halo-branched chain alkylene group having from 1 to 6 carbon atoms; and A is selected from the group consisting of cyano, nitro, lower alkoxy, lower alkyl, fluorine, dialkylamino, phenyl, halo-phenyl, benzyl and halo- benzyl, with the proviso that neither *m* + *i* nor *m'* + *i'* is greater than 5.

3,971,759

PLASTIC COMPOSITIONS CONTAINING POLYSTYRENE AND A BIS-PHENOXY FLAME RETARDANT

Arnold L. Anderson, Alma, Mich., assignor to Michigan Chemical Corporation, Chicago, Ill.

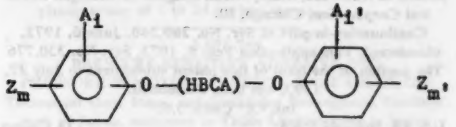
Continuation-in-part of Ser. No. 260,240, June 6, 1972, abandoned. This application Feb. 8, 1973, Ser. No. 330,855

The portion of the term of this patent subsequent to July 27, 1993, has been disclaimed.

Int. Cl.² C08K *5/05*

U.S. Cl. 260—45.9 KA 14 Claims

1. A plastic composition consisting essentially of polystyrene having incorporated therein an effective amount of a flame retardant which is a compound having the formula:



wherein Z is selected from the group consisting of bromine or chlorine; *m* and *m'* are integers having a value of 1-5; *i* and *i'* are integers having a value of 0-2; HBCA is a halo-branched chain alkylene group having from 1 to 6 carbon atoms; and A is selected from the group consisting of cyano, nitro, lower alkoxy, lower alkyl, fluorine, dialkylamino, phenyl, halo-phenyl, benzyl and halo- benzyl, with the proviso that neither *m* + *i* nor *m'* + *i'* is greater than 5.

3,971,760

PLASTIC COMPOSITIONS CONTAINING POLYURETHANE AND A BIS-PHENOXY FLAME RETARDANT

Arnold L. Anderson, Alma, Mich., assignor to Michigan Chemical Corporation, Chicago, Ill.

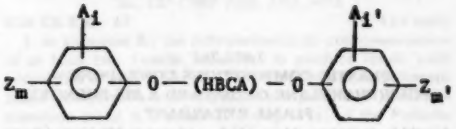
Continuation-in-part of Ser. No. 260,240, June 6, 1972, abandoned. This application Feb. 8, 1973, Ser. No. 330,788

The portion of the term of this patent subsequent to July 27, 1993, has been disclaimed.

Int. Cl.² C08K *5/05*

U.S. Cl. 260—45.9 KA 14 Claims

1. A plastic composition consisting essentially of polyurethane having incorporated therein an effective amount of a flame retardant which is a compound having the formula:



wherein Z is selected from the group consisting of bromine or chlorine; *m* and *m'* are integers having a value of 1–5; *i* and *i'* are integers having a value of 0–2; HBCA is a halo-branched chain alkylene group having from 1 to 6 carbon atoms; and A

is selected from the group consisting of cyano, nitro, lower alkoxy, lower alkyl, fluorine, dialkylamino, phenyl, halo-phenyl, benzyl and halo- benzyl, with the proviso that neither $m + i$ nor $m' + i'$ is greater than 5.

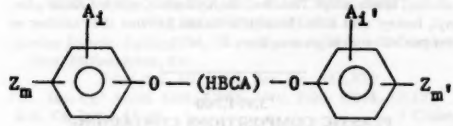
3,971,761

PLASTIC COMPOSITIONS CONTAINING POLYACRYLATES AND A BIS-PHENOXY FLAME RETARDANT

Arnold L. Anderson, Alma, Mich., assignor to Michigan Chemical Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 260,240, June 6, 1972, abandoned. This application Feb. 8, 1973, Ser. No. 330,776
The portion of the term of this patent subsequent to July 27, 1993, has been disclaimed.
Int. Cl.[2] C08K 5/05
U.S. Cl. 260—45.9 KA 14 Claims

1. A plastic composition consisting essentially of polyacrylate having incorporated therein an effective amount of a flame retardant which is a compound having the formula:



wherein Z is selected from the group consisting of bromine or chlorine; m and n' are integers having a value of 1–5; i and i' are integers having a value of 0–2; HBCA is a halo-branched chain alkylene group having from 1 to 6 carbon atoms; and A is selected from the group consisting of cyano, nitro, lower alkoxy, lower alkyl, fluorine, dialkylamino, phenyl, halo-phenyl, benzyl and halo-benzyl, with the proviso that neither $m + i$ nor $m' + i'$ is greater than 5.

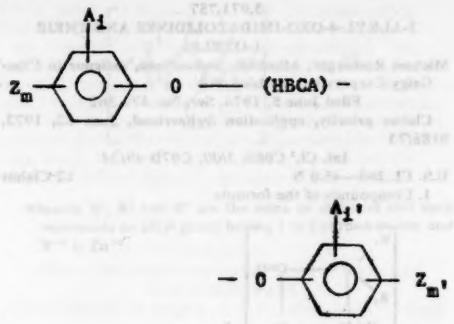
3,971,762

PLASTIC COMPOSITIONS CONTAINING POLY(PHENYLENE OXIDE) AND A BIS-PHENOXY FLAME RETARDANT

Arnold L. Anderson, Alma, Mich., assignor to Michigan Chemical Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 260,240, June 6, 1972, abandoned. This application Feb. 8, 1973, Ser. No. 330,858
Int. Cl.[2] C08K 5/05
U.S. Cl. 260—45.9 KA 14 Claims

1. A plastic composition consisting essentially of poly(phenylene oxide) having incorporated therein an effective amount of a flame retardant which is a compound having the formula:



wherein Z is selected from the group consisting of bromine or chlorine; m and m' are integers having a value of 1–5; i and i' are integers having a value of 0–2; HBCA is a halo-branched chain alkylene group having from 1 to 6 carbon atoms; and A is selected from the group consisting of cyano, nitro, lower alkoxy, lower alkyl, fluorine, dialkylamino, phenyl, halo-phenyl, benzyl and halo-benzyl, with the proviso that neither $m + i$ nor $m' + i'$ is greater than 5.

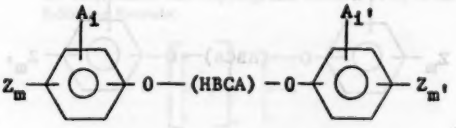
3,971,763

PLASTIC COMPOSITIONS CONTAINING POLYESTERS AND A BIS-PHENOXY FLAME RETARDANT

Arnold L. Anderson, Alma, Mich., assignor to Michigan Chemical Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 260,240, June 6, 1972, abandoned. This application Feb. 8, 1973, Ser. No. 330,899
The portion of the term of this patent subsequent to July 27, 1993, has been disclaimed.
Int. Cl.[2] C08K 5/05
U.S. Cl. 260—45.9 KA 14 Claims

1. A plastic composition consisting essentially of polyester having incorporated therein an effective amount of a flame retardant which is a compound having the formula:



wherein Z is selected from the group consisting of bromine or chlorine; m and m' are integers having a value of 1–5; i and i' are integers having a value of 0–2; HBCA is a halo-branched chain alkylene group having from 1 to 6 carbon atoms; and A is selected from the group consisting of cyano, nitro, lower alkoxy, lower alkyl, fluorine, dialkylamino, phenyl, halo-phenyl, benzyl and halo-benzyl, with the proviso that neither $m + i$ nor $m' + i'$ is greater than 5.

3,971,764
PROCESS FOR PRODUCING A CATIONIC POLYURETHANE

Horst Schürmann; Josef Bung, both of Duren, Germany, and Hendrikus Alouisius Van Aalten, Zevenaar, Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

Filed Dec. 26, 1974, Ser. No. 536,365
Int. Cl.² C08G *18/38*
U.S. Cl. 260—77.5 AM **24 Claims**

1. A process for the production of a cationic polyurethane which comprises:

converting a monomeric aliphatic dihydroxy compound substituted with an aliphatic side-chain of at least 10 carbon atoms, by reaction with a polyisocyanate into a preliminary adduct with terminal —NCO groups; and

chain-lengthening said adduct by reacting the terminal —NCO groups with

A. an aliphatic monomeric diol containing a tertiary nitrogen atom which is subsequently converted into the corresponding ammonium compound, or

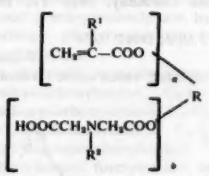
B. an aliphatic monomeric diol containing a tertiary nitrogen atom previously converted into the corresponding ammonium compound.

3,971,765
ANAEROBICALLY-CURING ADHESIVES

George Edward Green, Cherry Hinton, and Bernard Peter Stark, Stapleford, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 9, 1974, Ser. No. 531,029
Claims priority, application United Kingdom, Dec. 27, 1973, 59766/73
Int. Cl.² C08G *69/44*, *73/16*; C08F *18/14*, *120/02*
U.S. Cl. 260—78 A **31 Claims**

1. Anaerobically-polymerisable compositions comprising a polymerisable monomer and a redox-activatable initiator of free-radical polymerisation, in which the said monomer is an ester of the general formula



where

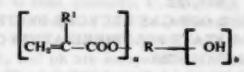
a is an integer of 1 to 4, and b is an integer of 1 or 2,

R denotes the residue, after removal of $(a + b)$ alcoholic hydroxyl groups, of an aliphatic, cycloaliphatic, araliphatic, or heterocycloaliphatic alcohol,

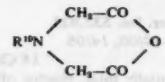
R^1 denotes —H, —Cl, —CH_3, or —C_2H_5, and

R^2 denotes a hydrogen atom or an aliphatic, cycloaliphatic, aromatic, araliphatic, heterocyclic, or heterocycloaliphatic group of 1 to 24 carbon atoms.

25. Anaerobically-polymerisable compositions comprising a polymerisable monomer and a redox-activatable latent initiator of free-radical polymerisation, in which the said monomer comprises an ester made by the esterification of an hydroxyl-containing acrylate ester of formula



with b g-mol. of an anhydride of formula



per g-mol. of the said acrylate ester, where

R, R^1, a, and b have the meanings assigned in claim 1, and

R^{10} denotes a hydrogen atom or an aliphatic, cycloaliphatic, aromatic, araliphatic, heterocyclic, or heterocycloaliphatic group of 1 to 24 carbon atoms.

3,971,766
PRESSURE-SENSITIVE ADHESIVE AND PRESSURE-SENSITIVE ADHESIVE TAPE OR DRAPE

Tomoyoshi Ono, Hino, and Yoshihiko Matsuguma, Hachioji, both of Japan, assignors to Teijin Limited, Osaka, Japan

Filed June 6, 1973, Ser. No. 367,474
Claims priority, application Japan, June 14, 1972, 47-58582; July 26, 1972, 47-74089
Int. Cl.² C08F *220/10*
U.S. Cl. 526—317 **11 Claims**

1. A pressure-sensitive adhesive comprising as a main constituent a copolymer comprising:

1. 94 to 98 mol% based on the total of components (1) and (2) of at least one alkyl acrylate monomer with the alkyl group containing 1 to 14 carbon atoms, the average number of the carbon atoms being 4 to 12, or a mixture of said alkyl acrylate with another monomer selected from the group consisting of methyl methacrylate, vinyl acetate and mixtures thereof, in a mol ratio of said alkyl acrylate to said other monomer of at least 5 to 1,

2. 2 to 6 mol% based on the total of components (1) and (2) of a monomer selected from the group consisting of acrylic acid, methacrylic acid, and mixtures thereof, and

3. 0.002 to 0.05 mol% based on the total of components (1) and (2) of a polyfunctional compound copolymerizable with the monomers (1) and (2) and having at least two non-conjugated carbon-to-carbon double bonds per molecule with the proviso that the amounts of component (1) and component (2) totals 100 mol%; said copolymer prepared by copolymerizing components (1), (2) and (3) by solution polymefization or emulsion polymerization.

3,971,767
OLEFIN POLYMERIZATION CATALYST SYSTEM AND PROCESS FOR POLYMERIZATION OF OLEFINS

Robert Alton Setterquist, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 471,811, May 20, 1974. This application July 30, 1975, Ser. No. 600,295
Int. Cl.² C08F *2/06*, *4/02*, *4/76*
U.S. Cl. 526—65 **12 Claims**

1. In a process for the polymerization or copolymerization of at least one 1-olefin monomer to produce linear, solid polyolefins of high molecular weight by the use, as polymerization catalyst, of a transition metal composition, in which the transition metal is a metal of Group IV(a) of the Periodic Table of the Elements, the improvements which consists essentially of employing as the transition metal composition a transition metal hydrocarbyl hydride aluminate supported on alumina in which said hydrocarbyl radical is selected from the group consisting of radicals having the structure RCH_2— in which R— is aryl, aralkyl in which no hydride radical is attached to the carbon atom bonded to the methylene group, or tertiary butyl, and in which from about 60% to substantially 100% of the radicals other than aluminate bonded to the transition metal are hydride radicals.

3,971,768

VAPOR PHASE REACTOR OFF-GAS RECYCLE SYSTEM FOR USE IN THE VAPOR STATE POLYMERIZATION OF MONOMERS

Edwin F. Peters, Winfield; Michael J. Spangler, Dolton; Glenn O. Michaels, South Holland, and James L. Jezl, St. Charles, all of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Dec. 16, 1974, Ser. No. 533,021
Int. Cl.[2] C08F *2/34, 10/00, 14/06*
U.S. Cl. 526—68 14 Claims

1. An essentially isobaric, essentially total, reactor off-gas recycle process comprising:

a. removing from a horizontal, vapor state reactor operating at polymerization conditions, off-gases containing at least quench liquid vapor and one or more polymerizable monomers from above a stirred, subfluidized bed of polymer distributed within the one or more polymerization sections of said reactor and removing entrained polymer from said off-gases to form a reactor off-gas stream;

b. condensing quench liquid from and removing any remaining entrained polymer from said reactor off-gas stream to form liquid recycle which contains at least said quench liquid and said any remaining entrained polymer and gaseous recycle which contains a reduced amount of said quench liquid vapor;

c. leading said gaseous recycle together with at least make-up of said one or more polymerizable monomers to one or more inlets spaced along said reactor and positioned largely underneath the surface of said bed and introducing said gaseous recycle and said at least make-up into said reactor;

d. leading a first portion of said liquid recycle to a plurality of inlets spaced along said reactor and located above the surface of said bed and introducing said portion into said reactor;

e. leading a second smaller portion of said liquid recycle together with make-up of at least one catalyst component to one or more inlets spaced along said reactor and introducing said portion into said reactor; and

f. introducing make-up quench liquid into said reactor.

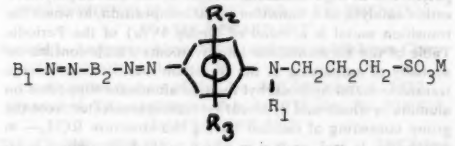
3,971,769

SULFOALKYL AMINOPHENYL DISAZO DYES

James F. Feeman, Wyomissing, Pa., assignor to Crompton & Knowles Corporation, New York, N.Y.

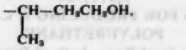
Continuation-in-part of Ser. No. 4,096, Jan. 17, 1970, abandoned, Continuation-in-part of Ser. No. 102,231, Dec. 28, 1970, abandoned. This application July 5, 1973, Ser. No. 376,606
Int. Cl.[2] C09B *31/18;* D06P *3/24, 3/40;* C09B *31/02*
U.S. Cl. 260—186 3 Claims

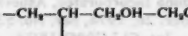
1. A water-soluble compound having the structure:



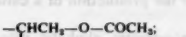
wherein

R_1 is alkyl having 1–8 carbon atoms, benzylcyclohexyl, $-CH_2CH_2OH$,





$-CH_2CH_2-O-COCH_3$ or



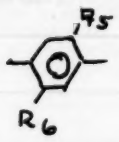
R_2 is —H, -alkyl having 1 to 4 carbon atoms, halogen, —O—alkyl having 1 to 4 carbon atoms or —NH—COR_4;

R_3 is —H, —alkyl having 1 to 4 carbon atoms, —O—alkyl having 1 to 4 carbon atoms or —NH—COR_4;

R_4, as used in R_2, R_3, R_5 and R_6, represents -alkyl having 1 to 4 carbon atoms, -tolyl, -phenyl or -halophenyl;

B_1 is phenyl or phenyl substituted with nitro, halogen, cyano, lower alkyl, lower alkoxy, trifluoromethyl, alkylsulfonyl, acetyl, carboxamido, sulfonamido, N-alkyl-sulfonamido, N,N-dialkylsulfonamido, N-alkylcarboxamido and carboxyl;

B_2 is 1,4-naphthylene or



R_5 is —H, -alkyl, -alkoxy, or —NHCOR_4;

R_6 is —H, -alkyl, -alkoxy, —NHCOR_4, —NH—SO_2—R_4 or halogen; and

M represents —H, —Na, —K, —Li or —N—NH_4.

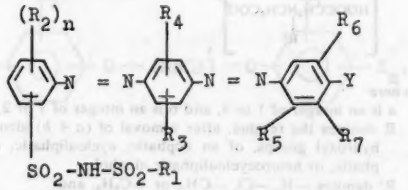
3,971,770

DISULFIMIDE DISAZO DYESTUFFS

Richard Sommer, Leverkusen; Georg Rainer, Constance, and Gerhard Wolfrum, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 37,031, May 13, 1970, abandoned. This application Dec. 5, 1973, Ser. No. 422,064
Claims priority, application Germany, May 17, 1969, 1925288
Int. Cl.[2] C09B *33/02;* D06P *3/24*
U.S. Cl. 260—186 9 Claims

1. Sulfonic acid-free disazo dyestuff which in the form of the free acid has the formula



in which R_1 is phenyl or phenyl substituted with methyl or C_1-C_4-alkyl;

R_2 is chlorine, bromine, C_1-C_4-alkyl or C_1-C_4-alkoxy;

R_3 and R_4 are identical or different and are hydrogen, C_1-C_4-alkyl or C_1-C_4-alkoxy;

R_5, R_6 and R_7, independently of one another are hydrogen, C_1-C_4-alkyl, C_1-C_4-alkoxy, halogen, -$CONH_2$, carboxylic acid

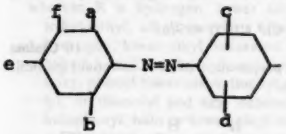
mono-C_1-C_2-alkylamide, carboxylic acid dimethylamide, carbo-C_1-C_2-alkoxy or carboxyl;
Y is hydroxyl or NR_8-R_9;
R_8 and R_9 each is C_1-C_4-alkyl;
C_1-C_4-alkyl substituted by hydroxyl or nitrile; or benzyl; and
n is 0, 1 or 2.

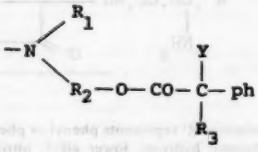
3,971,771
MONOAZO COMPOUNDS

Hans-Joerg Angliker, and Richard Peter, both of Basel, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Continuation of Ser. No. 195,492, Nov. 3, 1971, abandoned. This application Apr. 10, 1974, Ser. No. 459,518
Claims priority, application Switzerland, Nov. 11, 1970, 16658/70
Int. Cl.² C09B *29/08, 29/26*
U.S. Cl. 260—207 **5 Claims**

1. A compound of the formula





wherein
a is hydrogen, halogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, nitro, cyano, carbalkoxy wherein the alkoxy group thereof has 1 to 4 carbon atoms, or alkylsulfonyl of 1 to 4 carbon atoms,
b is hydrogen, halogen, alkyl of 1 to 4 carbon atoms, cyano or trifluoromethyl,
e is nitro, cyano, carbalkoxy wherein the alkoxy group thereof has 1 to 4 carbon atoms, sulfonamido, N-C_1-C_4-alkylated sulfonamido, or alkylsulfonyl of 1 to 4 carbon atoms,
f is hydrogen, halogen, carbalkoxy wherein the alkoxy group thereof has 1 to 4 carbon atoms, or aminocarbonyl,
c and *d* independently are hydrogen, C_1-C_2-alkyl, C_1-C_2-alkoxy, phenyl, phenoxy, benzyl, phenylethyl or phenylthio, and
c additionally represents bromo, trifluoromethyl, C_1-C_6-alkylcarbonylamino, C_6-C_7-arylcarbonylamino, C_1-C_6-alkoxycarbonylamino, C_6-C_7-aryloxycarbonylamino, C_1-C_6-alkylsulfonylamino, C_6-C_7-arylsulfonylamino, C_1-C_6-alkylaminocarbonylamino, C_6-C_7-arylaminocarbonylamino, formylamino, ureyl or chloroacetylamino,
R_1 is C_1-C_9-alkyl or C_1-C_9 alkyl substituted by phenyl, chloro, fluoro, hydroxy, cyano, cyanoethoxy, phenyloxy, phenylmercapto, C_1-C_4-alkoxy, C_1-C_4-alkoxy, formyloxy, C_1-C_{18}-alkylcarbonyloxy, C_6-C_7-arylcarbonyloxy, formylamido, C_1-C_6-alkylcarbonylamino, C_6-C_7-arylcarbonylamino, C_1-C_6-alkylsulfonyloxy, C_6-C_7-arylsulfonyloxy, C_1-C_6-alkylsulfonylamino, C_6-C_7-arylsulfonylamino, vinylsulfonyl, C_1-C_{18}-alkoxycarbonylox C_6-C_7-aryloxycarbonyloxy, C_1-C_{18}-alkylaminocarbonyloxy, C_6-C_7-arylaminocarbonyloxy, phenylacetyloxy, cinnamoyloxy, oleyloxycarbonyloxy, oleylaminocarbonyloxy, cyclohexylcarbonyloxy, or benzyloxycarbonyloxy,
R_2 is C_1-C_4-alkylene which is unsubstituted or substituted by chloro, bromo or hydroxy,
Y is halo, phenoxy, C_1-C_6-alkoxy, formyloxy, C_1-C_4-alkylcarbonyloxy, C_1-C_4-alkoxycarbonyloxy or C_1-C_4-alkylaminocarbonyloxy, and
R_3 and ph are independently phenyl or phenyl substituted by nitro, chloro, bromo, C_1-C_2-alkoxy or C_1-C_2 -alkyl, and
R_3 additionally represents hydrogen.

3,971,772
STEROIDAL[16α,17-b]1,4-DIOXANES AND STEROIDAL[16α,17-b]1,4-DIOXINS

Christopher M. Cimarusti, Hamilton; Seymour D. Levine, North Brunswick, and Frank L. Weisenborn, Titusville, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 538,978, Jan. 6, 1975, abandoned, which is a continuation-in-part of Ser. No. 433,974, Jan. 16, 1974, abandoned. This application May 19, 1975, Ser. No. 578,695
Int. Cl.² C07J *5/00*
U.S. Cl. 260—239.55 R **36 Claims**

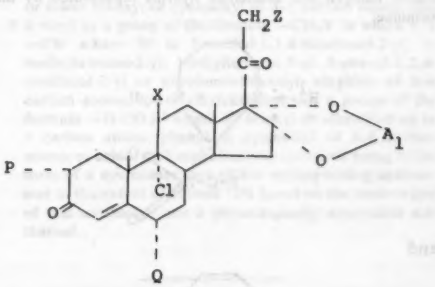
1. A 3,20-diketo pregnene having an 11β-hydroxy group or an 11-keto group and having fused on the 16 and 17 positions a 1,4-dioxane ring or a 1,4-dioxin ring.

3,971,773
STEROIDAL 9,11β-DIHALO-[16α,17-b]1,4-DIOXANES

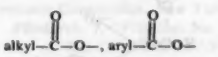
Christopher M. Cimarusti, Hamilton; Frank L. Weisenborn, Titusville, and Seymour D. Levine, North Brunswick, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 522,195, Nov. 8, 1974, abandoned. This application June 2, 1975, Ser. No. 583,149
Int. Cl.² C07D *471/00*
U.S. Cl. 260—239.55 R **10 Claims**

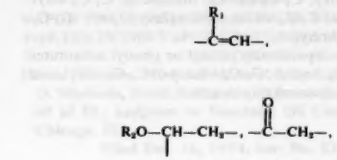
1. A steroid having the structure



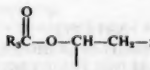
and the 1,2-dehydro and 6,7-dehydro derivatives thereof, wherein Z is hydrogen, hydroxy,



or halogen; X is chlorine or fluorine; A_1 is $—CH_2—CH_2—$,



or



R_1 is hydrogen, alkyl or aryl; R_2 is hydrogen or alkyl; R_3 is alkyl, cycloalkyl or aryl; and P and Q are independent of each other and are hydrogen, methyl or halogen.

3,971,774

2-(NITROMETHYLENE)-1,3-DIAZEPINES

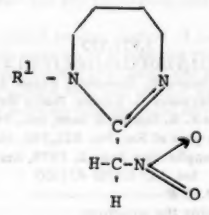
Charles H. Tieman; Willy D. Kollmeyer, and Steven A. Roman, all of Modesto, Calif., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 510,100, Sept. 27, 1974, which is a continuation-in-part of Ser. No. 412,373, Nov. 1, 1973, abandoned. This application Nov. 7, 1975, Ser. No. 630,065

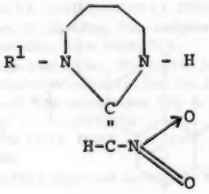
Int. Cl.² C07D *239/02*

U.S. Cl. 260—239 BC **1 Claim**

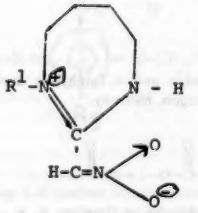
1. A compound of the group consisting of compounds of the formula:



derivatives thereof wherein the alpha hydrogen is replaced by middle halogen and resonance hybrids represented by the formulae:



and



wherein R^1 contains up to eight carbon atoms and is alkyl or alkenyl.

3,971,775

PROCESS FOR PREPARING PENICILLIN ANTIBIOTICS

Brian Richard Cowley, Ruislip, and David George Martin, Stoke Poges, both of England, assignors to Glaxo Laboratories Limited, Greenford, England

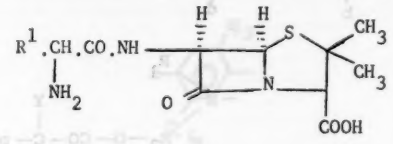
Filed May 2, 1975, Ser. No. 574,345

Claims priority, application United Kingdom, May 9, 1974, 20584/74

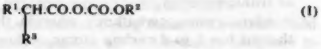
Int. Cl.² C07D *499/68*

U.S. Cl. 260—239.1 **10 Claims**

1. In a process for the preparation of an α-aminoacylpenicillin antibiotic of formula



wherein R^1 represents phenyl or phenyl substituted by chloro, bromo, hydroxy, lower alkyl, nitro, lower alkylamino, di(lower alkyl)amino, lower alkanoyl, lower alkanoylamido, lower alkoxy or lower alkylthio, by acylating 6-aminopenicillanic acid with a mixed anhydride of formula



(I)

wherein R^1 is as defined above, R^2 represents lower alkyl and R^3 represents a protected amino group wherein the protecting group is acid labile, and thereafter cleaving the acid-labile amine protecting group from the resulting N-protected α-aminoacylpenicillin derivative, the improvement whereby there is obviated the need for a solvent evaporation stage during isolation of an α-aminoacylpenicillin product, which improvement consists of the steps (i) contacting the 6-amino penicillanic acid with about 1.5-3 moles of a tri(lower alkyl)amine in the presence of a solvent selected from the group consisting of methylene chloride and chloroform at a temperature of from about 10°C to the reflux temperature of the solvent to yield a solution of a tri(lower alkyl)amine salt of 6-aminopenicillanic acid in said solvent; (ii) adding an anhydrous acid to the 6-aminopenicillanic acid salt solution to neutralise the residual tri(lower alkyl)amine therein; (iii) contacting the resulting neutralised solution with a solution of the mixed anhydride in methyl isobutyl ketone at a temperature of from about −50°C to about +30°C to yield a solution of the N-protected α-aminoacylpenicillin derivative; (iv) contacting said solution with water and a strong acid selected from the group consisting of mineral acids and toluene-p-sulphonic acid to cleave the acid-labile amine protecting group; and (v) recovering the α-aminoacylpenicillin or an acid addition salt thereof from the resulting water-containing system.

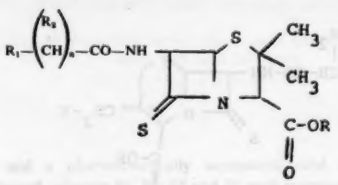
3,971,776

THIO-β-LACTAM PENICILLINS

Christopher M. Cimarusti, Hamilton, N.J.; Paul Wojtkowski, Wilmington, Del., and Joseph E. Dolfini, Cincinnati, Ohio, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Feb. 19, 1975, Ser. No. 551,221
Int. Cl.² C07D 499/44, 499/46, 499/48
U.S. Cl. 260—239.1 8 Claims

1. A compound of the formula



wherein R is hydrogen, lower alkyl, phenyl-lower alkyl, trihaloethyl, alkali metal or alkaline earth metal; R_1 is hydrogen, lower alkyl, saturated or unsaturated cycloalkyl of 3 to 7 carbons, phenyl, lower alkoxyphenyl, phenoxy, phenyl-lower alkyl, thienyl, furyl, oxazolyl, isoxazolyl, or thiazolyl and said heterocyclics bearing phenyl, halophenyl, halo or lower alkyl substituents; R_2 is hydrogen, amino, carboxy or ureido; and *n* is 0 or 1.

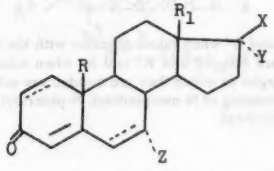
3,971,777

NOVEL STEROIDS AND THEIR USE

Geneviéve Rousseau, Paris, and Vesperto Torelli, Maisons-Alfort, both of France, assignors to Roussel-UCLAF, Paris, France

Filed Sept. 8, 1975, Ser. No. 611,126
Claims priority, application France, Sept. 18, 1974, 74.31501
Int. Cl.² C07J 33/00
U.S. Cl. 260—239.5 24 Claims

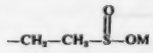
1. A compound of the formula



wherein R is selected from the group consisting of hydrogen and methyl, R_1 is alkyl of 1 to 4 carbon atoms, Z is selected from the group consisting of hydrogen and

of α-configuration, R_2 is alkyl of 1 to 4 carbon atoms, the dotted lines in the A and B rings represent optional 1 or 2 double bonds in the 1(2) position when R is methyl and in the 6(7) position when Z is hydrogen and X and Y together form the group

and when X is OH, Y is



and M is selected from the group consisting of hydrogen, $-NH_4$ and alkali metals.

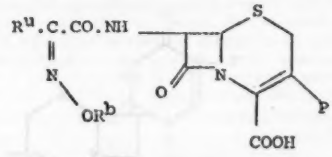
3,971,778

CEPHALOSPORINS HAVING (α-ETHERIFIED OXIMINO)ACYLAMIDO GROUPS AT THE 7-POSITION

Martin Christopher Cook; Gordon Ian Gregory, both of Chalfont St. Peter, and Janice Bradshaw, Harrow, all of England, assignors to Glaxo Laboratories Limited, Greenford, England

Continuation-in-part of Ser. No. 252,666, May 12, 1972,. This application Nov. 7, 1972, Ser. No. 304,524
Claims priority, application United Kingdom, Oct. 25, 1972, 49255/72
Int. Cl.² C07D 501/20
U.S. Cl. 260—243 C 32 Claims

1. A compound selected from the group consisting of a highly active cephalosporin antibiotic highly stable to β-lactamases of the formula



wherein

R^a is thienyl or furyl;

R^b is lower alkyl; lower alkyl substituted by amino, bromo or lower alkoxy; or cycloalkyl of 3–7 carbon atoms; and

P is vinyl or a group of the formula $-CH_2Y$ in which Y is —SW where W is 5-methyl-1,3,4-thiadiazol-2-yl, 1-methyltetrazol-5-yl, 1-ethyltetrazol-5-yl, 5-phenyl-1,3,4-oxadiazol-2-yl or nitrobenzothiazolyl; alkylthio of 1–4 carbon atoms; lower alkylcarbonylthio; a group of the formula $-O.CO.R^9$ where R^9 is alkyl or alkenyl of up to 4 carbon atoms, phenyl or cycloalkyl of 3–6 carbon atoms; or azido, said cephalosporin antibiotic being in the form of a syn-isomer free of the corresponding anti-isomer to the extent of at least 75% based on the total weight of said antibiotic; and a physiologically acceptable salt thereof.

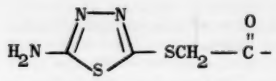
3,971,779

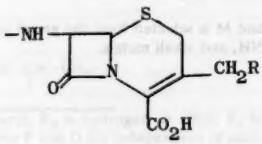
7-[2-(5-AMINO-1,3,4-THIADIAZOL-2-YLTHIO)ACETAMIDO]CEPHALOSPORINS

Abraham Nudelman, Bala Cynwyd, Pa., assignor to American Home Products Corporation, New York, N.Y.

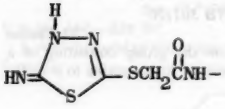
Filed Feb. 7, 1975, Ser. No. 547,832
Int. Cl.² C07D 501/34
U.S. Cl. 260—243 C 3 Claims

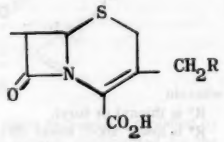
1. A chemical compound having the formula:

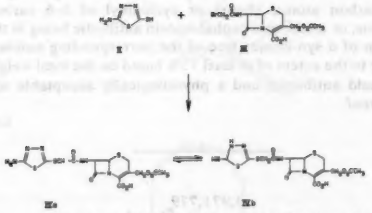




or







wherein

R is hydrogen or acetoxy and the pharmaceutically acceptable addition salts thereof.

3,971,780

THIO-β-LACTAM CEPHALOSPORINS

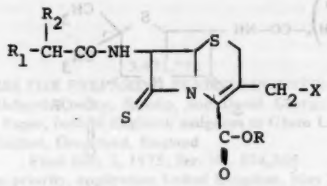
Christopher M. Cimarusti, Hamilton, N.J.; Paul Wojtkowski, Wilmington, Del., and Joseph E. Dolfini, Cincinnati, Ohio, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Feb. 19, 1975, Ser. No. 551,222

Int. Cl.² C07D *501/20, 501/02*

U.S. Cl. 260—243 C **13 Claims**

1. A compound of the formula



wherein R is hydrogen, lower alkyl, phenyl-lower alkyl, trihaloethyl, alkali metal or alkaline earth metal; R_1 is hydrogen, lower alkyl, saturated or unsaturated cycloalkyl of 3 to 7 carbons, phenyl, phenyl-lower alkyl, phenoxy, thienyl, furyl, oxazolyl, isoxazolyl, or thiazolyl; R_2 is hydrogen, amino, carboxy, hydroxy or ureido; and X is hydrogen, hydroxy or lower alkanoyloxy.

3,971,781

METAL SALTS OF 1,1,5,5-TETRASUBSTITUTED DITHIOBIURETS AND THEIR USE AS POPULATION CONTROL AGENTS

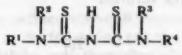
William R. Diveley, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 359,164, May 10, 1973. This application Oct. 28, 1975, Ser. No. 626,526

Int. Cl.² C07D *401/12, 413/12, 295/16*

U.S. Cl. 260—246 B **3 Claims**

1. A compound selected from the group consisting of the metal salts of 1,1,5,5-tetrasubstituted dithiobiurets of the formula:



in which R^1 and R^2 when taken together with the nitrogen to which they are bonded and R^3 and R^4 when taken together with the nitrogen to which they are bonded are selected from the group consisting of N-morpholinyl, N-piperidyl, N-pyrrolidyl and N-aziridinyl.

3,971,782

FLUORENE DERIVATIVES

Alan Chapman White, Windsor, and Robin Michael Black, Porton, both of England, assignors to John Wyeth & Brother, Maidenhead, England

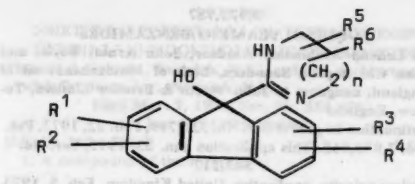
Filed Nov. 4, 1975, Ser. No. 628,621

Claims priority, application United Kingdom, Nov. 20, 1974, 50180/74

Int. Cl.² C07D *233/06, 239/06*

U.S. Cl. 260—251 R **3 Claims**

1. A compound selected from the group consisting of a fluorene derivative of formula



and a pharmaceutically acceptable acid addition salt thereof, wherein R^1, R^2, R^3 and R^4 each represents a member from the group consisting of hydrogen, hydroxyl, lower alkyl, lower alkoxy and halogen, R^5 and R^6 each represents a member from the group consisting of hydrogen and lower alkyl and n represents 1 or 2.

3,971,783
4-AMINOQUINAZOLINE DERIVATIVES AS CARDIAC STIMULANTS

Ian Thompson Barnish, Ramsgate; David Alexander Cox, Canterbury, and Anthony Garth Evans, Sandwich, all of England, assignors to Pfizer Inc., New York, N.Y.

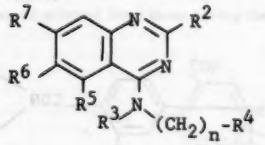
Continuation-in-part of Ser. No. 444,656, Feb. 21, 1974, abandoned. This application Apr. 26, 1974, Ser. No. 464,673

Claims priority, application United Kingdom, Mar. 7, 1973, 11018/73

Int. Cl.² C07D *401/12, 417/12*

U.S. Cl. 260—256.4 Q **9 Claims**

1. A compound of the formula



or a pharmaceutically acceptable acid-addition salt thereof;

wherein R^2 is selected from the group consisting of hydrogen, alkyl having from one to six carbon atoms, hydroxyalkyl having from one to six carbon atoms and alkoxyalkyl having from two to six carbon atoms;

R^3 is selected from the group consisting of hydrogen, benzyl, alkyl having from one to six carbon atoms, phenyl and alkoxyphenyl having from one to six carbon atoms in said alkoxy group;

R^4 is selected from the group consisting of pyridyl, quinolyl, thiazolyl, imidazolyl, pyrazinyl, indolyl, hydroxypyridyl, alkylpyridyl having from one to six carbon atoms in said alkyl group and alkylthiazolyl having from one to six carbon atoms in said alkyl group;

R^5 is hydrogen;

R^6 is selected from the group consisting of hydrogen, alkyl having from one to six carbon atoms, alkoxy having from one to six carbon atoms, hydroxy and amino;

R^7 is alkoxy having from one to six carbon atoms; and

n is 1, 2, 3 or 4;

providing that R^4 is linked to $(CH_2)_n$ through a ring-carbon atom.

3,971,784
5-FLUOROURACIL DERIVATIVES

Masao Tada, Sendai, Japan, assignor to Mitsui Pharmaceuticals, Incorporated, Tokyo, Japan

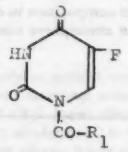
Filed Nov. 25, 1974, Ser. No. 527,143

Claims priority, application Japan, Nov. 28, 1973, 48-132795; Nov. 28, 1973, 48-132796

Int. Cl.² C07D *239/54*

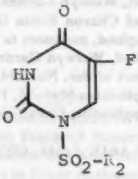
U.S. Cl. 260—256.5 R **27 Claims**

1. A 5-fluorouracil derivative represented by the formula



wherein R_1 represents phenyl, halogen substituted phenyl, nitro substituted phenyl, methylphenyl, methoxyphenyl or 2-furyl.

11. A 5-fluorouracil derivative represented by the formula



wherein R_2 represents methyl, ethyl, phenyl, methyl or ethyl substituted phenyl, halogen substituted phenyl, nitro substituted phenyl, acetamido substituted phenyl, naphthyl, thiofuryl, quinolyl or camphoryl.

3,971,785
PROCESS FOR THE MANUFACTURE OF FLOWED-IN AEROSOL CAN GASKETS

Thomas A. Messina, Waltham, and Patrick J. Droney, Arlington, both of Mass., assignors to W. R. Grace & Co., Cambridge, Mass.

Continuation of Ser. No. 302,005, Oct. 30, 1972, abandoned. This application Feb. 13, 1975, Ser. No. 549,564

Int. Cl.² B29C *25/00*

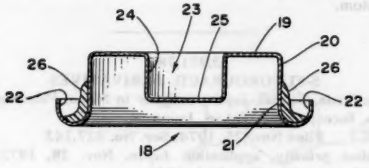
U.S. Cl. 264—268 **4 Claims**

1. A method for lining an aerosol can mounting cup with a sealing gasket consisting of:

a. depositing in the annular channel of the mounting cup a layer of a composition comprising (1) a liquid prepolymer of a free isocyanate groups-containing reaction product of a polyisocyanate with a polyhydroxy compound and (2) a finely divided carbon dioxide blocked polyamine;

b. heating the cup and said composition deposited therein to a temperature sufficient to cause decomposition of said polyamine with time, but said heating being for a time

sufficient to gel said composition only and insufficient to cause substantial decomposition of said polyamine; and



c. then allowing said composition to cure further at ambient temperature in an atmosphere containing moisture.

3,971,786

PYRIDYL ALKYLGUANIDINE COMPOUNDS, COMPOSITION THEREWITH, AND METHODS OF INHIBITING H-2 HISTAMINE RECEPTORS

Graham John Durant, Welwyn Garden City; John Colin Emmett, Codicote, and Charon Robin Ganellin, Welwyn Garden City, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

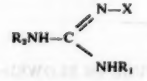
Continuation-in-part of Ser. No. 384,992, Aug. 2, 1973, abandoned. This application Mar. 14, 1975, Ser. No. 558,532

Claims priority, application United Kingdom, Sept. 5, 1972, 41161/72

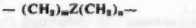
Int. Cl.² A61K *31/44;* **C07D** *213/34*

U.S. Cl. 424—263 **12 Claims**

1. A compound of the formula:



wherein R_1 is hydrogen or lower alkyl; R_2 is a grouping of the formula:



wherein Het is a pyridyl ring which is optionally substituted by lower alkyl, trifluoromethyl, hydroxy, halogen or amino; Z is sulphur, oxygen, NH or a methylene group; *m* is 0, 1 or 2 and *n* is 2 or 3, the sum of *m* and *n* being from 2 to 4; X is SO_2R_4 or $N{=}CHR_5$ R_4 is phenyl optionally substituted by halogen, lower alkyl or amino; and R_5 is phenyl or a pharmaceutically acceptable acid addition salt of said compound.

3,971,787

(4-QUINOLYLAMINO)BENZAMIDES

John Leheup Archibald, Windsor; John Arnott Boyle, and John Christopher Saunders, both of Maidenhead, all of England, assignors to John Wyeth & Brother Limited, Taplow, England

Continuation-in-part of Ser. No. 334,799, Feb. 22, 1973, Pat. No. 3,875,165. This application Jan. 23, 1975, Ser. No. 543,217

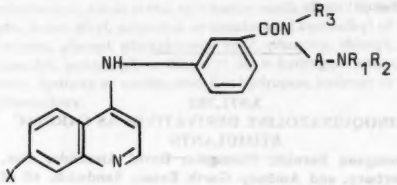
Claims priority, application United Kingdom, Feb. 5, 1973, 5531/73

The portion of the term of this patent subsequent to Apr. 1, 1992, has been disclaimed.

Int. Cl.² C07D *215/44, 401/12*

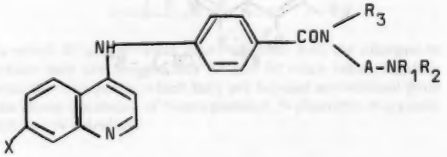
U.S. Cl. 260—286 R **2 Claims**

1. A compound selected from those having the formulae



(II)

and



(III)

and their pharmaceutically acceptable acid addition salts, wherein X is halogen, the group —A—NR_1R_2 is di(lower alkyl) amino(lower alkyl) and R_3 is lower alkyl.

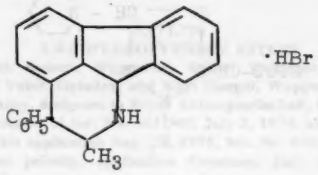
3,971,788

2-METHYL-3-PHENYL-1,2,3,10b-TETRAHYDROINDENO[1,2,3-ij]-ISOQUINOLINE HYDROBROMIDE

Thomas J. Schwan, Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Mar. 7, 1975, Ser. No. 556,478
Int. Cl.² C07D 217/02
U.S. Cl. 260—286 R 1 Claim

1. A compound of the formula:



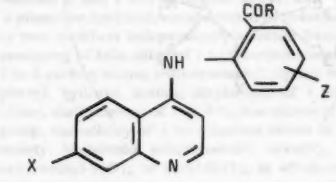
3,971,789

O-(4-QUINOLYLAMINO)BENZAMIDES

John Leheup Archibald, Windsor; John Terence Arnott Boyle, and John Christopher Saunders, both of Maidenhead, all of England, assignors to John Wyeth & Brother Limited, Taplow, England

Continuation-in-part of Ser. No. 334,799, Feb. 22, 1973, Pat. No. 3,875,165. This application Jan. 23, 1975, Ser. No. 543,218
Claims priority, application United Kingdom, Oct. 21, 1972, 48593/72; Feb. 5, 1973, 5531/73
The portion of the term of this patent subsequent to Apr. 1, 1992, has been disclaimed.
Int. Cl.² C07D 215/44, 401/12
U.S. Cl. 260—286 R 4 Claims

1. A compound selected from those having the formula



and their pharmaceutically acceptable acid addition salts, wherein X is selected from halogen and trifluoromethyl; Z is selected from the group consisting of hydrogen, halogen and lower alkyl; and R is selected from di(lower alkyl-)aminopiperidino and a group having the formula

wherein R^{10} is selected from hydrogen and lower alkyl and R^{11} is selected from di(lower alkyl)amino(lower alkyl) and 1-(lower alkyl)piperidinyl.

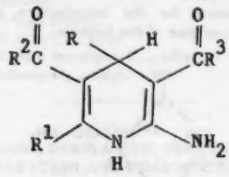
3,971,790

2-AMINO-1,4-DIHYDROPYRIDINE DERIVATIVES

Horst Meyer, Wuppertal; Friedrich Bossert, Wuppertal-Elberfeld; Wulf Vater, Opladen, and Kurt Stoepel, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Division of Ser. No. 438,603, Feb. 1, 1974, Pat. No. 3,929,798, which is a division of Ser. No. 336,639, Feb. 28, 1973, Pat. No. 3,867,393. This application May 5, 1975, Ser. No. 574,347
Claims priority, application Germany, Mar. 6, 1972, 2210674
Int. Cl.² C07D 215/32, 401/04
U.S. Cl. 260—287 K 6 Claims

1. A compound of the formula:



wherein

R is quinolyl, isoquinolyl or pyridyl, unsubstituted or substituted by one or two members selected from the group consisting of lower alkyl, lower alkoxy and halogeno;

R^1 and R^2 together are alkylene of 2 to 4 carbon atoms; and

R^3 is lower alkyl, lower alkoxy, lower alkoxy(lower alkoxy), lower alkenyloxy, lower alkynyloxy, amino, lower alkylamino or di(lower alkyl)amino.

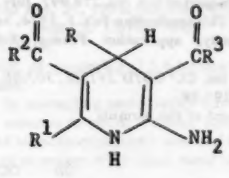
3,971,791

2-AMINO-1,4-DIHYDROPYRIDINE DERIVATIVES

Horst Meyer, Wuppertal; Friedrich Bossert, Wuppertal-Elberfeld; Wulf Vater, Opladen, and Kurt Stoepel, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Division of Ser. No. 438,603, Feb. 1, 1974, Pat. No. 3,929,798, which is a division of Ser. No. 336,639, Feb. 28, 1973, Pat. No. 3,867,393. This application May 6, 1975, Ser. No. 575,018
Claims priority, application Germany, Mar. 6, 1972, 2210674
Int. Cl.² C07D 215/32, 405/04, 409/04
U.S. Cl. 260—287 K 4 Claims

1. A compound of the formula:



wherein

R is thienyl or furyl, unsubstituted or substituted by one or two members selected from the group consisting of lower alkyl, lower alkoxy and halogeno;

R^1 and R^2 together are alkylene of 2 to 4 carbon atoms; and

R^3 lower alkyl, lower alkoxy, lower alkoxy(lower alkoxy), lower alkenyloxy, lower alkynyloxy, amino, lower alkylamino or di(lower alkyl)amino.

3,971,792

PROCESS FOR THE MANUFACTURE OF 4-AMINO-3-AMINOMETHYLPIPERIDINE

Helmut Zondler, Allschwil, Switzerland, and Wolfgang Pfleiderer, Constance, Germany, assignors to Ciba-Geigy AG, Basel, Switzerland

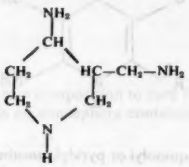
Continuation-in-part of Ser. No. 316,308, Dec. 18, 1972, abandoned, which is a division of Ser. No. 125,382, March 17, 1971, Pat. No. 3,717,593. This application June 10, 1974, Ser. No. 477,890

Claims priority, application Switzerland, Mar. 23, 1970, 4337/70

Int. Cl.² C07D 211/98

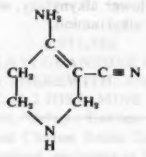
U.S. Cl. 260—293.52 8 Claims

1. In a process for the manufacture of 4-amino-3-aminomethyl-piperidine of the formula



(I)

by reduction of 4-amino-3-cyano-1,2,5,6-tetrahydropyridine of the formula



(II)

the improvement comprising hydrogenating said 4-amino-3-cyano-1,2,5,6-tetrahydropyridine under pressure and in the presence of ammonia and a hydrogenation catalyst.

3,971,793

CERTAIN 6-(DIALKYLAMINO, PYRROLIDINO AND PIPERIDINO)ETHOXY-4,7-DIMETHOXY-5-(3-PHENYL-1-HYDROXYPROPYL)2,3-DIHYDROBENZOFURANS

Claude P. Fauran, Paris; Jeannine A. Eberle, Chatou; Guy R. Bourgery, Colombes; Guy M. Raynaud, Paris, and Bernard M. Pourrias, Meudon la Foret, all of France, assignors to Delalande S.A., Courbevoie, France

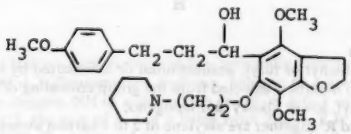
Continuation-in-part of Ser. No. 274,997, July 25, 1972, Pat. No. 3,850,937. This application Feb. 1, 1974, Ser. No. 438,744

Claims priority, application France, Feb. 12, 1973, 73.04872

Int. Cl.² C07D 211/22, 307/86

U.S. Cl. 260—293.58 8 Claims

1. A compound of the formula



and the pharmaceutically acceptable acid addition salts thereof.

3,971,794

THIAZOLIDINONE ACETIC ACID DERIVATIVES

Gerhard Satzinger, Denzlingen; Manfred Herrmann, St. Peter, and Karl-Otto Vollmer, Freiburg, all of Germany, assignors to Warner-Lambert Company, Morris Plains, N.J.

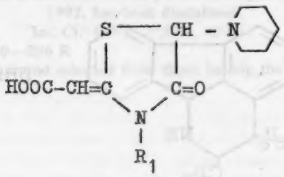
Filed Feb. 27, 1975, Ser. No. 553,715

Claims priority, application Germany, Mar. 25, 1974, 2414345

Int. Cl.² C07D 295/12

U.S. Cl. 260—293.68 8 Claims

1. A thiazolidinone-acetic acid derivative of the formula:



wherein R_1 is a lower alkyl radical containing 1 to 4 carbon atoms or a physiologically compatible salt thereof.

3,971,795

PIPERIDINE DERIVATIVES

Barry Cook, Manchester, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

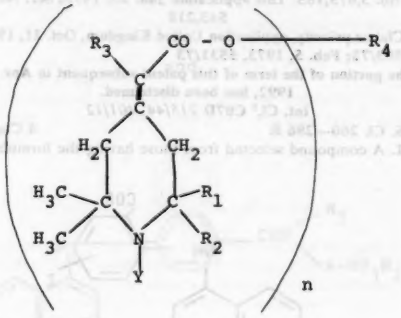
Filed July 17, 1973, Ser. No. 380,041

Claims priority, application United Kingdom, July 28, 1972, 35486/72

Int. Cl.² C07D 211/30

U.S. Cl. 260—293.88 11 Claims

1. A compound of the formula



wherein

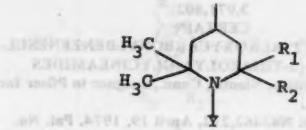
n is 1, 2, 3 or 4,

Y is hydrogen or a straight- or branched alkyl residue having from 1 to 12 carbon atoms, an alkenyl residue having from 3 to 12 carbon atoms or an aralkyl residue having from 7 to 12 carbon atoms,

R_1 and R_2 are the same or different and each is a straight- or branched alkyl residue having from 1 to 12 carbon atoms or R_1 and R_2, together with the carbon atom to which they are attached, form a cycloalkyl group having from 5 to 12 carbon atoms,

R_3 is hydrogen or a straight- or branched alkyl residue having from 1 to 4 carbon atoms,

R_4 is a hydrocarbyl residue having from 1 to 20 carbon atoms, or, when *n* is 1, R_4 is, in addition, hydrogen or has the structure:



wherein Y, R_1 and R_2 are as defined above.

3,971,796
1,4-DIHYDROPYRIDINE ESTERS

Friedrich Bossert, Wuppertal; Egbert Wehinger, Neviges; Wulf Vater, Opladen, and Kurt Stoepel, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

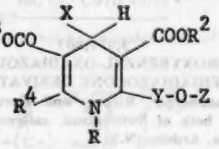
Continuation of Ser. No. 485,300, July 2, 1974, abandoned. This application Aug. 29, 1975, Ser. No. 609,153

Claims priority, application Germany, July 12, 1973, 2335466

Int. Cl.² C07D 213/55

U.S. Cl. 260—294.8 F **20 Claims**

1. A compound selected from the group consisting of a dihydropyridine of the formula:



and the pharmaceutically acceptable nontoxic salts thereof, wherein

Y is alkylene of 1 to 4 carbon atoms;

Z is alkyl of 1 to 4 carbon atoms;

R is hydrogen, alkyl of 1 to 4 carbon atoms, or alkenyl of 2 to 4 carbon atoms;

each of R^3 and R^3, independent of the other, is alkyl of 1 to 6 carbon atoms, alkenyl of 2 to 6 carbon atoms, alkynyl of 2 to 6 carbon atoms or cycloalkyl of 3 to 10 carbon atoms;

R^4 is hydrogen, alkyl of 1 to 6 carbon atoms or Z—O—Y— wherein Z and Y are as defined above; and

X is phenyl or naphthyl, unsubstituted or substituted by one or two members independently selected from the group consisting of halo, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, trifluoromethyl, cyano, nitro, azido, phenyl, hydroxy, amino, alkylamino of 1 to 4 carbon atoms, dialkylamino of 1 to 4 carbon atoms in each alkyl group, carbalkoxy of 1 to 4 carbon atoms in the alkoxy moiety, acetamido, propionamido, acetoxy, propionyloxy, methyl-$S(O)_m$ or ethyl-$S(O)_m$ in which m is 0, 1 or 2.

3,971,797
S,S'-BIS(PYRIDYLMETHYL)-CARBONODITHIOATES

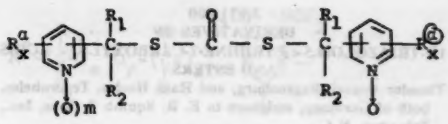
Tsung-Ying Shen, Westfield; Howard Jones, Holmdel; Dennis M. Mulvey, Milford, and Conrad P. Dorn, Plainfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 368,774, June 15, 1973, abandoned. This application May 16, 1974, Ser. No. 470,231

Int. Cl.² C07D 213/59

U.S. Cl. 260—294.8 E **3 Claims**

1. A compound of structural formula:



or pharmaceutically acceptable salt thereof, wherein R_1 is hydrogen, C_{1-3} alkyl, or phenyl; R_2 is hydrogen or C_{1-3} alkyl; m is 0 or 1; x is an integer from 0–4, and R is

1. 3 or 5 hydroxy,
2. 3, 5, or 6 C_{1-3} alkoxy,
3. 2, 3, 4, 5, or 6 C_{1-3} alkyl,
4. 2, 3, 4, 5, or 6 mercapto-C_{1-3} alkyl, or
5. 4 or 5 hydroxy-C_{1-3} alkyl.

3,971,798
PYRIDINE DERIVATIVE, PROCESSES OF PREPARATION AND PHARMACEUTICAL COMPOSITIONS

Daniel Humbert, Paris, and Roger Ratouis, Saint-Cloud, both of France, assignors to Roussel-UCLAF, Paris, France

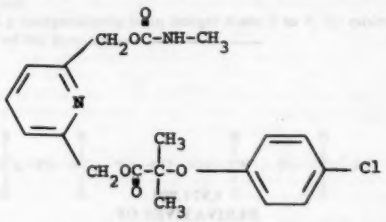
Filed July 2, 1974, Ser. No. 485,244

Claims priority, application France, July 5, 1973, 73.24737

Int. Cl.² C07D 213/24

U.S. Cl. 260—295 CA **3 Claims**

1. The 2-(p-chlorophenoxy) 2,2-dimethylacetate of 6'-(N-methylaminocarbonyloxymethyl) 2'-pyridyl methyl of the formula:



or a non-toxic acid addition salt thereof.

3,971,799
PREPARATION OF 3,5,6-TRICHLOROPICOLINIC ACID

Stanley D. McGregor, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 27, 1974, Ser. No. 537,054

Int. Cl.² C07D 213/26

U.S. Cl. 260—295 R **7 Claims**

1. A process of preparing 3,5,6-trichloropicolinic acid which comprises:

a. reacting, by contacting under reflux conditions for from about 15 minutes to about 2 hours, stoichiometric proportions of tetrachloropicolinic acid and hydrazine in the presence of an excess of an alkali metal reaction medium in water;

b. reacting, by contacting for about 5 minutes to about 1 hour, the thus formed 3,5,6-trichloro-4-hydrazinopicolinic acid intermediate with from about a 10 to 20 percent excess of an alkaline hypochlorite in the presence of an aqueous alkali metal hydroxide; and

c. acidifying the reaction mixture to a pH of about 2 with a mineral acid and recovering the 3,5,6-trichloropicolinic acid product.

3,971,800
DERIVATIVES OF 1H-TRIAZOLO[4,5-c]PYRIDINE-7-CARBOXYLIC ACIDS AND ESTERS

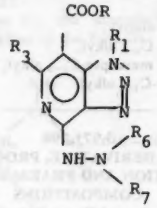
Theodor Denzel, Regensburg, and Hans Hoehn, Tegernheim, both of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 471,537, May 20, 1974, Pat. No. 3,929,812, This application Sept. 10, 1975, Ser. No. 612,060

Int. Cl.² C07D *213/55*

U.S. Cl. 260—295.5 B **4 Claims**

1. A compound of the formula



wherein R is hydrogen or lower alkyl; R_1 is hydrogen, lower alkyl, phenyl, benzyl or phenethyl; and R_3, R_6 and R_7 each is hydrogen, lower alkyl or phenyl.

3,971,801
DERIVATIVES OF 1H-TRIAZOLO[4,5-c]PYRIDINE-7-CARBOXYLIC ACIDS AND ESTERS

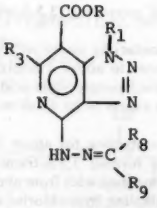
Theodor Denzel, Regensburg, and Hans Hoehn, Tegernheim, both of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 471,537, May 20, 1974, Pat. No. 3,929,812. This application Sept. 10, 1975, Ser. No. 612,061

Int. Cl.² C07D *213/55*

U.S. Cl. 260—295.5 B **4 Claims**

1. A compound of the formula



wherein R is hydrogen or lower alkyl; R_1 is hydrogen, lower alkyl, phenyl, benzyl or phenethyl; R_8 and R_9 each is hydrogen, lower alkyl or phenyl; and R_9 is lower alkyl or phenyl.

3,971,802
CERTAIN N'-ALKYL-N'-(2'-ALKOXYCARBONYLBENZENESULFONYL)-N-(2-THIAZOLYL)GLYCINEAMIDES

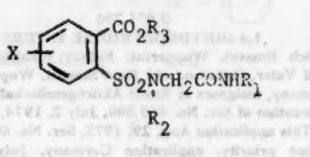
Joseph G. Lombardino, Niantic, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 462,212, April 19, 1974, Pat. No. 3,927,002, which is a division of Ser. No. 353,607, April 23, 1973, Pat. No. 3,853,862. This application Apr. 4, 1975, Ser. No. 565,230

Int. Cl.² C07D *277/46*

U.S. Cl. 260—306.8 R **3 Claims**

1. A compound of the formula:



wherein R_1 is selected from the group consisting of; 2-thiazolyl and 4,5-dimethyl-2-thiazolyl;

R_2 is alkyl having from 1 to 3 carbon atoms;

X is selected from the group consisting of hydrogen, methyl, methoxy, fluoro, chloro and bromo and

R_3 is alkyl having from 1 to 3 carbon atoms.

3,971,803
3-HYDROXYBENZYL-OXADIAZOLONE AND -THIADIAZOLONE DERIVATIVES

Siegfried Rosenberger, Riehen, and Kurt Schwarzenbach, Pfeffingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

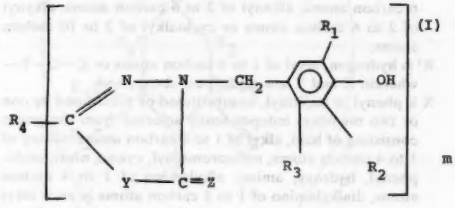
Filed May 15, 1974, Ser. No. 469,988

Claims priority, application Switzerland, May 21, 1973, 7190/73

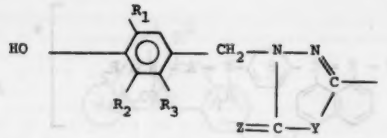
Int. Cl.² C07D *271/10*

U.S. Cl. 260—307 A **6 Claims**

1. A compound of the formula



wherein R_1 is alkyl with 1 to 8 carbon atoms, R_2 is hydrogen or alkyl with 1 to 8 carbon atoms, R_3 is hydrogen or methyl, R_4, if $m = 1$, is hydrogen; alkyl with 1 to 18 carbon atoms; a group of the formula $C_xH_{2x+1}—Q—C_yH_{2y}—$, wherein Q is an oxygen or sulphur atom and x and y are integers of which the sum is 2 to 20; cyclohexyl, cyclooctyl, or methylcyclohexyl; alkylthio or alkyloxy with 1 to 18 carbon atoms; benzyl, phenylethyl, phenylpropyl, diphenylmethyl, benzyl; phenylethyl or phenylpropyl substituted by up to 2 alkyls of 1 to 4 carbon atoms each and/or by hydroxyl; unsubstituted phenyl or naphthyl; phenyl substituted by up to 2 substituents selected from halogen, hydroxyl, alkyl with up to 12 carbon atoms, alkoxy with 1 to 12 carbon atoms, or alkoxycarbonyl with 2 to 5 carbon atoms; or a group



wherein R_1, R_2 and R_3 have the above meaning and y and z independently of one another are oxygen or sulphur, or, if m=2, R_4 is alkylene of 1 to 8 carbon atoms, a group of the formula $-C_xH_{2x}-O-C_yH_{2y}-$, wherein Q is an oxygen or suphur atom and x and y are integers of which the sum is 2 to 4, phenylene, diphenylene, or naphthylene, Y and Z independently of one another are oxygen or sulphur and m is the number 1 or 2.

3,971,804

BIS-TRIFLUORO METHYL-IMINO-IMIDAZOLONES

Arno Widdig, Blecher; Ingeborg Hammann, Cologne, and Helmut Kaspers, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

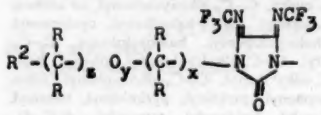
Filed Jan. 21, 1975, Ser. No. 542,885

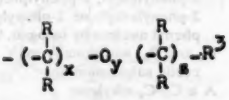
Claims priority, application Germany, Jan. 24, 1974, 2403224

Int. Cl.² C07D *49/34*

U.S. Cl. 260—309.7 **14 Claims**

1. A bis-trifluoromethyl-iminoimidazolone of the formula





in which

each R independently is hydrogen or methyl,

R^2 is a radical selected from the group consisting of bridged hydrocarbon rings; fused hydrocarbon rings; directly linearly linked hydrocarbon rings; hydrocarbon rings linked through oxygen, alkylene, oxyalkylene or alkylenoxyalkylene; and substitution products of any of the foregoing with halogen, alkyl or alkoxy with 1 to 4 carbon atoms; said radicals comprising at least two hydrocarbon rings, at least one of which is non-aromatic;

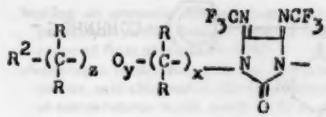
R^3 is hydrogen or a radical selected from the group consisting of alkyl, alkenyl or alkynyl with up to 8 carbon atoms; substitution products of any of the foregoing with halogen or alkoxy with 1 to 4 carbon atoms; cycloalkyl with 5 to 7 carbon atoms; cycloalkyl with 5 to 7 carbon atoms and substituted by alkyl with 1 to 4 carbon atoms; phenylalkyl with up to 4 carbon atoms in the alkyl part; phenyl; substitution products of these phenylalkyl and phenyl radicals with halogen, alkyl, haloalkyl or alkoxy with 1 to 4 carbon atoms; and any of the radicals listed under R^2;

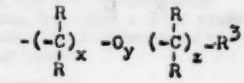
each x independently is an integer from 0 to 4,

each y independently is 0 or 1 except that y must be 0 if x is 0, and

each z independently is an integer from 0 to 4.

14. A process for the preparation of a bis-trifluoromethyl-imino-imidazolone of the formula





in which

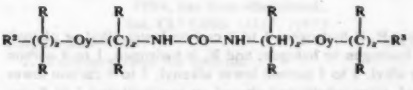
each R independently is hydrogen or methyl,

R^2 is a radical selected from the group consisting of bridged hydrocarbon rings; fused hydrocarbon rings; directly linearly linked hydrocarbon rings; hydrocarbon rings linked through oxygen, alkylene, oxyalkylene or alkylenoxyalkylene; and substitution products of any of the foregoing with halogen, alkyl or alkoxy with 1 to 4 carbon atoms; said radicals comprising at least two carbon rings, at least one of which is non-aromatic;

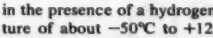
R^3 is hydrogen or a radical selected from the group consisting of alkyl, alkenyl or alkynyl with up to 8 carbon atoms; substitution products of any of the foregoing with halogen or alkoxy with 1 to 4 carbon atoms; cycloalkyl with 5 to 7 carbon atoms; cycloalkyl with 5 to 7 carbon atoms and subsituted by alkyl with 1 to 4 carbon atoms; phenylalkyl with up to 4 carbon atoms in the alkyl part; phenyl; substitution products of these phenylalkyl and phenyl radicals with halogen, alkyl, haloalkyl or alkoxy with 1 to 4 carbon atoms,

each x independently is an integer from 0 to 4, each y independently is 0 or 1 except that y must be 0 if x is 0, and

each z independently is an integer from 0 to 4, by mixing a urea of the formula



in the presence of a hydrogen fluoride acceptor at a temperature of about −50°C to +120°C with N,N'-bis-(trifluoromethyl)tetrafluoro-ethylene-1,2-diamine which in situ generates perfluoro-2,5-diazahexa-2,4-diene of the formula



which reacts with the urea.

3,971,805

IMINOISOINDOLINONE PIGMENTS AND PROCESS FOR THEIR MANUFACTURE

Ernst Model, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

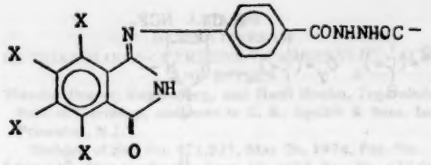
Filed Apr. 17, 1975, Ser. No. 569,041

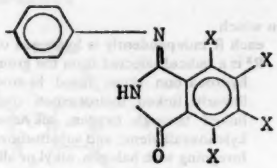
Claims priority, application Switzerland, Apr. 30, 1974, 5909/74

Int. Cl.² C07D *209/46*

U.S. Cl. 260—325 PH **2 Claims**

1. An iminoisoindolinone pigment of the formula





wherein the X denote chlorine or bromine atoms.

3,971,806

INDOLOTHIOPYRONES

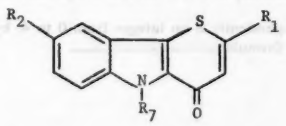
Richard E. Brown, East Hanover, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed May 9, 1974, Ser. No. 468,349

Int. Cl.[2] C07D *513/02*

U.S. Cl. 260—326.28 16 Claims

1. A compound of the formula IX:



wherein R_1 is hydrogen, 1 to 4 carbon lower alkyl or phenyl; R_2 is hydrogen or halogen; and R_7 is hydrogen, 1 to 4 carbon lower alkyl, 3 to 4 carbon lower alkenyl, 3 to 4 carbon lower alkynyl, nitro-substituted-phenyl, or ω-substituted .l to 4 carbon lower alkyl wherein the substituent is:

—COOH, or

wherein R_4 and R_5 each represent hydrogen or 1 to 4 carbon lower alkyl; and R_6 is 1 to 4 carbon lower alkoxy or amino.

3,971,807

CATIONIC DYESTUFFS

Alfred Brack, Odenthal, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

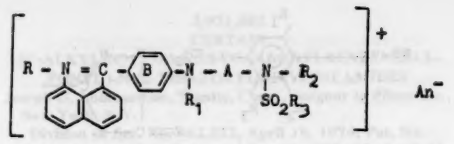
Filed Dec. 6, 1974, Ser. No. 530,444

Claims priority, application Germany, Dec. 6, 1973, 2360876

Int. Cl.[2] C07D *209/56*

U.S. Cl. 260—326.9 7 Claims

1. Dyestuff of the formula



in which

R is C_1–C_6-alkyl, C_3–C_6-alkenyl, C_3–C_6 -haloalkenyl, ethylene bonded to the β-position of the naphthalene ring, or C_1–C_6-alkyl substituted by halogen, C_1–C_4-alkoxy, cyano, C_1–C_4-alkoxycarbonyl, or carbonamide;

R_1 is hydrogen, C_1–C_6-alkyl, C_3–C_6-alkenyl, C_3–C_6-haloalkeny alkylene selected from the group consisting of $-CH_2-CH_2-(CH_2)_3-CH_2-CH(CH_3)-CH(CH_3-$, and $-CH_2-CH_2-CH(CH_3)-$ bonded to ring B in the 0-position or C_1–C_6-alkyl substituted by halogen, C_1–C_4-alkoxy, cyano, C_1–C_4-alkoxycarbonyl, or carbonamide;

R_2 is hydrogen, C_1–C_6-alkyl, C_1–C_6-alkyl substituted by halogen or C_1–C_4-alkoxy, C_3–C_6-alkenyl, C_3–C_6-haloalkenyl, cyclopentyl, cyclohexyl, halocyclopentyl, halocyclohexyl, C_1–C_4-alkylcyclopentyl, C_1–C_4-alkylcyclohexyl, phenyl, halophenyl, C_1–C_4-alkylphenyl, C_1–C_4-alkoxyphenyl, nitrophenyl, cyanophenyl, pyridinyl pyrimidinyl, triazinyl, triazolyl, thiazolyl, imidazolyl, tetrazolyl, benzyl, 2-phenylethyl, 2-phenylpropyl-(2) or any of said benzyl, 2-phenylethyl, or 2-phenylpropyl-(2) substituted in the phenyl nucleus by halogen, C_1–C_4-alkyl, or C_1–C_4-alkoxy;

R_3 is C_1–C_6-alkyl, C_1–C_6-alkyl substituted by halogen, C_1–C_4-alkoxy, cyano, C_1–C_4-alkoxycarbonyl, or carbonamide, C_3–C_6-alkenyl, C_3–C_6-haloalkenyl, cyclopentyl, cyclohexyl, halocyclopentyl, halocyclohexyl, C_1–C_4-alkylcyclopentyl, C_1–C_4-alkylcyclohexyl, phenyl, halophenyl, C_1–C_4-alkylphenyl, C_1–C_4-alkoxyphenyl, nitrophenyl, cyanophenyl, pyridinyl, pyrimidinyl, triazinyl, triazolyl, thiazolyl, imidazolyl, tetrazolyl, di-C_1–C_4-alkylamino, morpholino, piperidino, piperazino, benzyl, 2-phenylethyl, 2-phenylpropyl-(2) or any of said benzyl, 2-phenylethyl, or 2-phenylpropyl-(2) substituted in the phenyl nucleus by halogen, C_1–C_4-alkyl, or C_1–C_4-alkoxy;

R_2 and R_3, additionally maY be joined together to form a cyclic sulphonamido;

A is C_2–C_4-alkylene;

An $^{(-)}$is an anion;

Ring B may be fused to another benzene ring; and the cyclic and acyclic radicals in the above formula may be further substituted by C_1–C_4-alkoxy, β-methoxyethoxy, β-cyanoethoxy, allyloxy, halogen, amino, C_1–C_4-alkylamino, benzylamino, acetylamino, methylsulphonylamino, phenylsulphonylamino, dimethylamino, phenylamino, methylsulphonyl, phenylsulphonyl, methoxycarbonyl, ethoxycarbonyl, carbamoyl, or cyano, and the cyclic radicals may additionally be substituted by C_1–C_4-alkyl.

3,971,808

SPIRODIPYRANS AND CHROMOGENIC MATERIALS FOR COPYING PROCESSES

Hans Baumann, and Andreas Oberlinner, both of Ludwigshafen, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

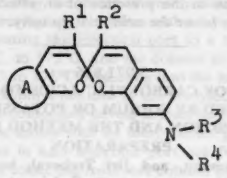
Filed May 7, 1974, Ser. No. 467,829

Claims priority, application Germany, May 11, 1973, 2323803

Int. Cl.[2] C07D *311/02*

U.S. Cl. 260—345.2 6 Claims

1. A spirodipyran of the formula



in which

A is an unsubstituted benzene or (2,1-b)-naphthalene nucleus, or a benzene or a (2,1-b)-naphthalene nucleus substituted by one chloro, bromo, methoxy, ethoxy or carbalkoxy containing a C_1 to C_4 alkoxy,

R^1 is phenyl, phenyl substituted by chloro, bromo or alkyl of from 1 to 4 carbon atoms,

R^2 is hydrogen, alkyl of from 1 to 8 carbon atoms or phenyl, and

R^3 and R^4 are methyl, ethyl or propyl.

3,971,809

3A,4,7,7A-TETRAHYDRO-4-PHENYLETHYL-7A-ALKYL-5(6H)-INDANONES AND PROCESS FOR THE PREPARATION THEREOF

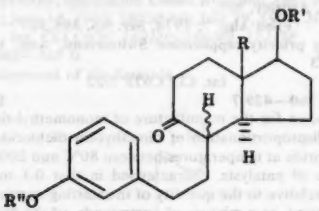
Noal Cohen, Montclair, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 375,558, July 2, 1973, Pat. No. 3,856,864, which is a continuation-in-part of Ser. No. 295,032, Oct. 4, 1972, abandoned. This application Sept. 30, 1974, Ser. No. 510,261

Int. Cl.² C07D *309/22*

U.S. Cl. 260—345.9 **2 Claims**

1. A compound of the formula



wherein R is lower alkyl, R′ is a group of the formula

wherein R_2 is hydrogen, R_3 and R_4 taken together are lower alkylene of 4 carbon atoms and R″ is lower alkyl.

3,971,810

SOLID PESTICIDAL CHLORINATED PHENOLIC CONCENTRATES

Robert E. Reusser, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 423,457, Dec. 10, 1973, abandoned. This application Feb. 18, 1975, Ser. No. 550,502

Int. Cl.² A01N *9/26*

U.S. Cl. 424—347 **5 Claims**

1. A pesticidal chlorinated phenolic concentrate in the form of a solid homogeneous mixture prepared by:

heating an aromatic hydrocarbon carrier to its melting point, said carrier being a solid at temperatures in the range of from about 0° to 50°C;

dissolving a chlorinated phenolic derivative in the melted carrier, said chlorinated phenolic derivative being a solid at temperatures in the range of from about 0° to 50°C; and

cooling the resultant mixture to form said concentrate;

said concentrate comprising from about 1 to 75 weight percent of said chlorinated phenolic derivative and 99 to 25 weight percent of said carrier.

3,971,811

5-(4-CHLOROPHENYL)-2-FURYL PHENYL KETONE

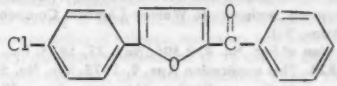
Stanford S. Pelosi, Jr., Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed June 16, 1975, Ser. No. 586,874

Int. Cl.² C07D *307/46*

U.S. Cl. 260—347.8 **1 Claim**

1. The compound 5-(4-chlorophenyl)-2-furyl phenyl ketone of the formula:



3,971,812

ANTHRAQUINONE DYESTUFFS

Walter Hohmann; Klaus Wunderlich, both of Leverkusen, and Hans-Samuel Bien, Burscheid, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 49,526, June 24, 1970, Pat. No. 3,686,232. This application Aug. 11, 1972, Ser. No. 279,756

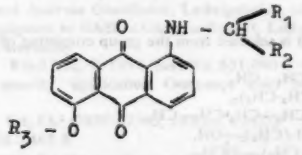
Claims priority, application Germany, June 27, 1969, 1932646; Mar. 23, 1970, 2013789; Mar. 23, 1970, 2013790

The portion of the term of this patent subsequent to Aug. 22, 1989, has been disclaimed.

Int. Cl.² C09B *1/512, 1/515*

U.S. Cl. 260—380 **5 Claims**

1. A compound of the formula



in which R_1 and R_2 are C_1–C_3-alkyl or C_1–C_3 alkyl substituted by chloro, bromo, hydroxy or cyano; and

R_3 is hydrogen; C_1–C_3-alkyl; or C_1–C_3 alkyl substituted with hydroxy, lower alkoxy, or lower alkoxy lower alkoxy.

3,971,813

GLYCIDYL COMPOUNDS CONTAINING PHOSPHORUS

Daniel Porret, Binningen; Jürgen Habermeier, Pfeffingen, and Dieter Baumann, Birsfelden, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 9, 1973, Ser. No. 404,835

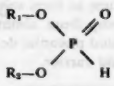
Claims priority, application Switzerland, Oct. 13, 1972, 15041/72

Int. Cl.² C07D *233/02*

U.S. Cl. 260—309.5 **3 Claims**

1. An adduct prepared by reacting a hydantoin compound selected from the group consisting of 1,3-diglycidyl-5,5-dime-

thylhydantoin, the triglycidyl compound produced from 1,3-bis-(5,5-dimethylhydantoinyl-3)-propan-2-ol, 1-(glycidyloxymethyl)-3-glycidyl-5,5-dimethylhydantoin, 1,3-diglycidyl-5,5-pentamethylenehydantoin, bis-(3-glycidyl-5,5-dimethylhydantoinyl-1)-methane and 1,3-diglycidyl-5,5-dimethylhydantoin, and a compound of the formula I



(I)

wherein R_1 and R_2 each represent an alkyl of 1 to 4 carbon atoms, monochloroethyl or together form an alkylene of to 5 carbon atoms, wherein said adduct contains from 1 to 8% phosphorus and has an epoxide content between 1 to 6 equivalents/kg.

3,971,814

BENZO(b)THIOPHENE DERIVATIVES

Peter Johannes Stoss, Wildtal; Manfred Franz Reinhold Herrmann, Gundelfingen, and Gerhard Satzinger, Denzlingen, all of Germany, assignors to Warner-Lambert Company, Morris Plains, N.J.

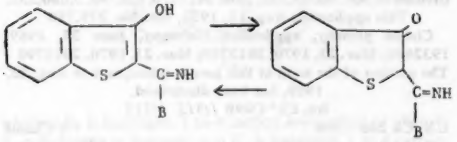
Division of Ser. No. 419,305, Nov. 27, 1973, Pat. No. 3,907,826. This application Apr. 9, 1975, Ser. No. 566,469

Claims priority, application Germany, Nov. 27, 1972, 2258036

Int. Cl.² C07D *333/64*

U.S. Cl. 260—330.5 **20 Claims**

1. Novel benzo(b)thiophene compounds of the formula:



wherein B is selected from the group consisting of:

—NH_2,
—NH-CH_2—CH_3,
—N-(CH_2-CH_3)$_2$,
—NH-CH_2—CH_2-CH_2—CH_3,
——NH-(CH_2)$_2$—OH,
—NH-(CH_2)$_2$—OCH_3,
—NH-(CH_2)$_2$—OCH_2—CH_3,
—NH-(CH_2)$_3$—OCH_3,
—NH-(CH_2)$_3$—OC_2H_5,
—NH-(CH_2)$_3$-O-CH(CH_3)$_2$,
—NH-(CH_2)$_3$—O-C_4H_9, and
—NH-(CH_2)$_3$—O—CH_2CH(CH_3)$_2$.

3,971,815

ACID MIX PROCESS

John A. Sagel, Mount Healthy, Ohio, and Clarence Edward Weber, Cold Spring, Ky., assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 13, 1974, Ser. No. 523,390

Int. Cl.² C11D *1/12, 1/28*

U.S. Cl. 260—400 **15 Claims**

1. In the process of sulfating an organic detergent precursor the steps including contacting the detergent precursor with a sulfating agent, the improvement thereon comprising carrying out the reaction in the presence of an effective amount of benzoic acid to lower the acid mix viscosity.

3,971,816

ESTERS OF CARBOXYLIC ACIDS FORMALLY SUBSTITUTED BY SODIUM OR POTASSIUM IN THE ALPHA-POSITION AND THE METHOD FOR THEIR PREPARATION

Lubomir Lochmann, and Jiri Trekoval, both of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Filed Nov. 21, 1974, Ser. No. 525,855

Claims priority, application Czechoslovakia, Nov. 26, 1973, 8135-73; Sept. 4, 1974, 6085-74

Int. Cl.² C11C *3/02*

U.S. Cl. 260—410.9 R **8 Claims**

1. Esters of carboxylic acids substituted with sodium or potassium initially in the alpha-position of the general formula I

$R^1R^2CMCOOR^3$ (I)

where

R^1 is phenyl or tolyl,
R^2 is alkyl with 1 to 6 carbon atoms in the straight or branched chain
R^3 is alkyl with 1 to 12 carbon atoms in the straight or branched chain,
M is sodium or potassium.

3,971,817

PROCESS FOR THE MANUFACTURE OF MONOMETHYL-TIN TRICHLORIDE

Hans Wolf Jung, Anderten; Rudolf Maul, Lorsch, Hesse; Siegfried Kintopf, Bensheim, Bergstrasse; Wilfried Kloss, Kolmback uber Bensheim, and Reinhard Knapp, Heppenheim, Bergstrasse, all of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 7, 1974, Ser. No. 495,357

Claims priority, application Switzerland, Aug. 16, 1973, 11804/73

Int. Cl.² C07F *7/22*

U.S. Cl. 260—429.7 **14 Claims**

1. Process for the manufacture of monomethyl-tin trichloride b disproportionation of dimethyl-tin dichloride and tin tetrachloride at temperatures between 80°C and 200°C, in the presence of catalysts, characterised in that 0.1 to 20% by weight, relative to the quantity of the starting components, of a compound, or a mixture of compounds, of the formula I

R_aEX_b (I)

wherein E represents nitrogen, phosphorus, arsenic or antimony, X represents chlorine, bromine or iodine, R denotes identical or different, linear or branched, alkyl groups with 1 to 18 carbon atoms, *a* represents the numbers 3 or 4, and *b* represents the numbers 0 or 1 or 2, and the sum of *a* and *b* is equal to 3 or 5 and, if E represents nitrogen, *b* can only denote 1, is employed as the catalyst.

3,971,818

METHOD OF PREPARING OLEFINIC SILOXANE BY GLC

Chi-Long Lee, and Ollie W. Marko, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Dec. 2, 1974, Ser. No. 528,959

Int. Cl.² C07F *7/08, 7/18*

U.S. Cl. 260—448.2 E **9 Claims**

1. A method of reacting an acetylenic alcohol with a siloxane compound having at least three silicon-bonded hydrogen atoms bonded to at least three different silicon atoms in the presence of a platinum catalyst to provide an olefinic siloxane compound wherein the olefinic siloxane compound is an inhibitor for the platinum catalyst

comprising coating the inside of an injection port of a gas liquid chromatographic column with a layer of a platinum catalyst, heating the injection port to a temperature of from 300°C. to 375°C. and the column at a temperature from 100°C. to 375°C., injecting into the heated injection port and column a mixture of the acetylenic alcohol and the siloxane compound having at least three silicon-bonded-hydrogen atoms with an inert carrier gas where residence times in said injection port are from 0.5 to 10 seconds and collecting from said column an olefinic siloxane compound which is, below 100°C., an inhibitor for the reaction betwen the acetylenic alcohol and the siloxane compound having at least three silicon-bonded-hydrogen atoms in the presence of a platinum catalyst.

3,971,819
3-AMINO, 4-THIO-SUBSTITUTED, 5-SULPHAMYL-BENZOIC ACID DERIVATIVES

Peter Werner Feit, Gentofte, Denmark, assignor to Lovens Kemiske Fabrik Produktionsaktieselskab, Ballerup, Denmark

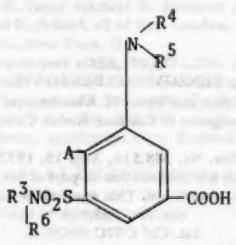
Division of Ser. No. 887,409, Dec. 22, 1969, Pat. No. 3,806,534. This application Nov. 15, 1973, Ser. No. 416,163

Claims priority, application United Kingdom, Dec. 24, 1968, 61339/68; June 18, 1969, 38038/69; July 29, 1969, 30898/69

Int. Cl.² C07C *149/20, 149/40, 121/78*

U.S. Cl. 260—465 D **3 Claims**

1. A compound of the formula



in which A is R^3 — S —, R^2, R^3, and R^4 are saturated or unsaturated aliphatic hydrocarbon radicals having from 1 to 7 carbon atoms, cycloalkyl and cycloalkenyl radicals having from 3-8 carbon atoms, phenyl-lower alkyl radicals having from 7 to 10 carbon atoms or cycloalkyl — lower alkyl radicals having from 4 to 12 carbon atoms, R^2 and R^3 may also be mono- or bi-cyclic carbocyclic aryl radicals, R^5 is a lower alkyl radical, R^6 is a lower alkyl radical or a lower alkanoyl groups, R^3, R^4, R^5 and R^6 may also be a hydrogen atom, R^3 may also be substituted with chlorine, fluorine, methyl, trifluoromethyl, carboxy, carbethoxy, dimethyl amino, hydroxy, methoxy, benzyloxy, or sulfamyl groups and R^4 may be substituted with chlorine, methyl, and methoxy groups; pharmaceutically acceptable salts thereof, and esters thereof with lower alkanols, phenol, cyanomethanol or benzyl alcohol.

3,971,820
PROCESS FOR THE PRODUCTION OF DIAMINOMALEONITRILE

Tatsumi Kobayashi, Kurashiki; Eiji Nishiwaki, Arai; Shigeharu Yamazoe, Tokyo; Mitsuyuki Hoshino, Urawa; Sadafumi Yoshino, and Katsunori Mikuma, both of Kurashiki, all of Japan, assignors to Nippon Soda Company Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 400,858, Sept. 26, 1973. This application Nov. 25, 1974, Ser. No. 526,631

Claims priority, application Japan, Nov. 30, 1973, 48-133596

Int. Cl.² C07C *120/00, 121/30*

U.S. Cl. 260—465.5 R **11 Claims**

1. In a process for the production of diaminomaleonitrile by tetramerization of hydrogen cyanide in the presence of a basic catalyst selected from the group consisting of alkalimetal cyanide, alkalimetal hydroxide, ammonia and alkylamines, the improvement therein which comprises tetramerizing hydrogen cyanide in the liquid phase at a temperature in the range of −20° to 130°C for a time period of from about 20 minutes to about 7 hours, in the presence of at least one cocatalyst selected from the group consisting of:

a. thiophenol, thionaphthol, benzylthiol, and the aforesaid thiols having at least one substituent selected from the group consisting of halogen, mercapto, and a lower alkyl,

b. dialkyl disulfides containing 2 to 16 carbon atoms,

c. diphenyl disulfide, dinaphthyl disulfide, benzyl disulfide and said disulfides having at least one substituent selected from the group consisting of halogen, mercapto and a lower alkyl.

3,971,821
PRODUCTION OF AMINOBENZALDEHYDES

Hans Baumann, Ludwigshafen; Klaus Grychtol, Bad Durkheim, and Andreas Oberlinner, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

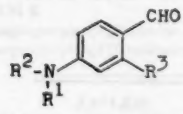
Filed Dec. 9, 1974, Ser. No. 531,090

Claims priority, application Germany, Dec. 20, 1973, 2363458

Int. Cl.² C07C *87/60, 101/00, 121/78*

U.S. Cl. 260—465 E **7 Claims**

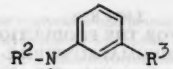
1. A process for the production of an aminobenzaldehyde compound of the formula



(Ia)

wherein R^1 and R^2 may be identical or different and each is alkyl of 1 to 8 carbon atoms or aralkyl of 7 to 12 carbon atoms; and R^3 is nitro, cyano or

in which R^4 is alkyl of 1 to 8 carbon atoms, cyclopentyl, aralkyl of 7 to 12 carbon atoms or phenyl; which process comprises reacting an aniline of the formula



(II),

wherein R^1, R^2 and R^3 have the above-noted meanings, in the presence of an acid halide of phosphorous acid, phosphoric acid, carbonic acid, oxalic acid, sulfurous acid or sulfuric acid with a formamide of the formula

(III),

wherein R^5 and R^6 may be identical or different and each is hydrogen, alkyl of 1 to 4 carbon atoms or phenyl, or R^5 and R^6 together with the adjacent nitrogen atom may further form a heterocyclic ring member selected from the group consisting of piperidine, pyrrolidine and morpholine, with the proviso that said R^1 to R^6 may further contain substituents which are inert under the reaction conditions.

3,971,822

ASPARTYL AMIDE SWEETENING AGENTS

Ichiro Chibata, Suita; Munetugu Miyoshi, Nishinomiya; Hiroshi Ito, Itami; Toshiyuki Fujii, Toyonaka, and Keisuke Kawashima, Takatuki, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

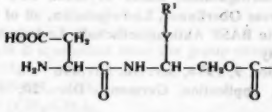
Filed June 25, 1975, Ser. No. 590,020

Claims priority, application Japan, July 19, 1974, 49-83406; Sept. 17, 1974, 49-107293

Int. Cl.² C07C *69/00, 69/52, 99/00*

U.S. Cl. 260—468 R **28 Claims**

1. A compound of the formula:



wherein R^1 is hydrogen or hydroxy, R^2 is alkyl of one to five carbon atoms, alkenyl of two to three carbon atoms, cycloalkyl of three to five carbon atoms or methylcycloalkyl of four to six carbon atoms, and Y is alkylene of one to four carbon atoms.

3,971,823

CYCLITOLAMINES

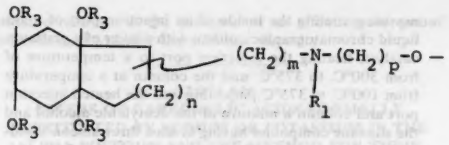
Frederic P. Hauck, Somerville, N.J.; Joseph E. Sundeen, Yardley, Pa., and Joyce Reid, Highland Park, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

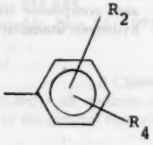
Filed Dec. 2, 1975, Ser. No. 636,891

Int. Cl.² C07C *93/00, 93/12*

U.S. Cl. 260—490 **17 Claims**

1. A compound having the structure





or a pharmaceutically acceptable salt thereof, wherein R_1 is alkyl, phenylalkyl or phenylalkyl wherein the ring is substituted by 1 or 2 groups selected from the group of halogen, alkyl or alkoxy having 1–6 carbon atoms, said alkyl moieties having 1–6 carbon atoms; R_2 is hydrogen, halogen, alkyl, or alkoxy; R_3 is alkanoyl having 1–7 carbon atoms; R_4 is hydrogen or alkanoyl having 1–7 carbon atoms; n is 1, 2 or 3; m is 1, 2, 3 or 4; and p is 2, 3 or 4; with the proviso that when R_4 is alkanoyl, R_3 and R_4 are the same.

3,971,824

p-BENZOYLOXYBENZOATE

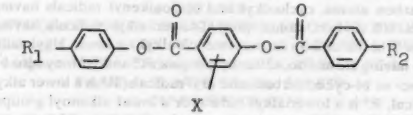
James P. Van Meter, and Bruce H. Klanderman, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 388,516, Aug. 15, 1973, Pat. No. 3,915,883, which is a continuation-in-part of Ser. No. 247,563, April 26, 1972, abandoned. This application June 11, 1975, Ser. No. 585,919

Int. Cl.² C07C *69/76*

U.S. Cl. 260—473 R **2 Claims**

1. A liquid crystalline compound of the formula:



wherein:

R_1 is an alkyl group of about 4 to 8 carbon atoms,

R_2 is an alkyl group of about 4 to 8 carbon atoms or an alkoxy group having about 4 to 8 carbon atoms, and

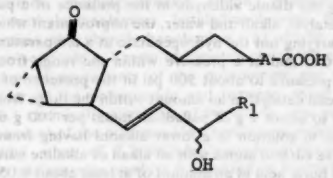
X is a halogen atom.

3,971,825
PHARMACEUTICALLY USEFUL PROSTENOIC ACID DERIVATIVES

Kiyoshi Sakai; Takashi Yusa, and Kenji Inoue, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Filed Nov. 26, 1974, Ser. No. 527,353
Claims priority, application Japan, Dec. 6, 1973, 48-137588
Int. Cl.² C07C 61/38, 69/74
U.S. Cl. 260—514 D 12 Claims

1. A compound selected from prostenoic acid derivatives having the formula



wherein

A is a linking group selected from the class consisting of a direct single bond and an alkylene group having from 1 to 8 carbon atoms; and

R^1 is an alkyl group having from 1 to 10 carbon atoms;

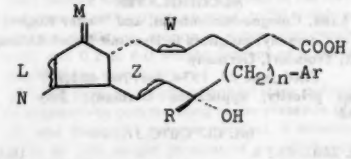
and pharamaceutically acceptable salts thereof.

3,971,826
15-SUBSTITUTED-ω-PENTANORPROSTAGLANDINS

Hans-Jurgen E. Hess; Michael R. Johnson; Jasjit S. Bindra, and Thomas K. Schaaf, all of New London, Conn., assignors to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 271,220, July 13, 1972, abandoned, and a continuation-in-part of Ser. No. 425,519, Dec. 17, 1973, abandoned. This application July 3, 1974, Ser. No. 485,599
Claims priority, application New Zealand, July 4, 1974, 485596
Int. Cl.² C07C 63/592
U.S. Cl. 260—520 B 17 Claims

1. A compound of the structure:



and the C_{15} epimer thereof wherein

Ar is biphenyl;

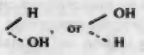
R is hydrogen or lower alkyl;

n is an integer from 1 to 5;

W and *L* are each a single bond or cis double bond;

Z is single bond or trans double bond; with the proviso that when *n* is one and *Z* is a single bond, *W* is a single bond;

M is keto,



N is hydrogen or α-hydroxyl;

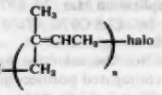
and wherein *L*, *M* and *N* are so selected as to complete the structure of a prostaglandin of the A, E or F series.

3,971,827
MANUFACTURE OF POLY-(CIS)-ISOPRENOLS

John S. Baran, Winnetka, and Barnett S. Pitzele, Skokie, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Sept. 9, 1974, Ser. No. 504,096
Int. Cl.² C07C 57/18, 57/02, 29/02
U.S. Cl. 260—526 N 5 Claims

1. A process for the production of γ-alkylated acids which comprises the steps of successively contacting 2-butynoic acid with an alkali metal salt of 2,2,6,6-tetramethylpiperidine and a halo-polyene of the formula



wherein *n* is 1 or 2.

5. A process for the production of cis-isoprenol which comprises the steps of:

a. successively contacting 2-butynoic acid with an alkali metal salt of 2,2,6,6-tetramethylpiperidine and 1-bromo-3-methyl-2-butene to produce 7-methyloct-6-en-2-ynoic acid as the major product and 2-ethenylidene-5-methyl-4-hexenoic acid as the minor product;

b. esterifying the acids of step a to produce the corresponding methyl 7-methyloct-6-en-2-ynoate and methyl-2-acetyl-5-methyl-4-hexenoate;

c. chromatograhically separating the compounds of step b to isolate methyl 7-methyloct-6-en-2-ynoate;

d. contacting the isolated product of step c with lithium dimethyl cuprate and methyl copper to produce methyl (Z)-3,7-dimethylocta-2,6-dienoate; and

e. reducing the product of step d to produce (Z)-3,7-dimethylocta-2,6-dien-1-ol.

3,971,828
N-(MERCAPTOACYL)AMINOACIDS

Itaru Mita, Ashiya; Shigeo Okumura, Takarazuka; Shigeru Yamabe, Kobe; Yoshihiko Funae, Suita, and Junzo Matumoto, Osaka, all of Japan, assignors to Santen Pharmaceutical Co. Ltd., Osaka, Japan

Division of Ser. No. 398,934, Sept. 20, 1973, Pat. No. 3,897,480. This application Dec. 23, 1974, Ser. No. 535,686
Claims priority, application Japan, Oct. 3, 1972, 47-110491; May 11, 1973, 48-52924
Int. Cl.² C07C 149/243
U.S. Cl. 260—534 S 2 Claims

1. N-(2-mercaptopropionyl)β-alanine.

2. N-(2-mercaptopropionyl)5-aminocaproic acid.

3,971,829
PREPARATION OF METHYLENE-BRIDGED POLYPHENYLPOLYAMINE MIXTURES

Edward Thomas Marquis, Austin, Tex., assignor to Jefferson Chemical Company, Inc., Houston, Tex.

Filed Nov. 18, 1974, Ser. No. 524,568
Int. Cl.² C07C 85/08
U.S. Cl. 260—570 D 10 Claims

1. An improved process for the preparation of a mixture of methylene-bridged polyphenylpolyamines containing diaminodiphenylmethane having a high 4,4'-isomer content and higher molecular weight, higher functionality polymethylene

polyphenylpolyamines by the catalyzed condensation reaction of aniline and formaldehyde, comprising the steps of:

mixing and reacting aniline and formaldehyde in the presence of up to about 3.0 weight percent of a co-catalyst system comprising about 0.1 to less than about 3.0 weight percent silica-alumina and about 0.1 to less than about 3.0 weight percent oxalic acid, based upon the weight of aniline present, at a temperture of about 150° to about 250°C. and a pressure of from about atmospheric to about 300 psig; and

recovering the reaction product mixture of methylene-bridged polyphenylpolyamines.

3,971,830

PROCESS FOR THE SEMIHYDROGENATION OF CITRAL TO CITRONELLAL

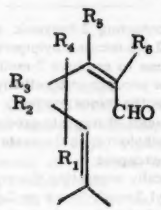
Peter S. Gradeff, Andover, N.J., assignor to Rhodia, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 211,794, Dec. 23, 1971, abandoned. This application Mar. 24, 1975, Ser. No. 561,469

Int. Cl.² C07C *47/20*

U.S. Cl. 260—601 R **14 Claims**

1. In the process for the selective hydrogenation of the olefinic group in a conjugated position to the carbonyl group in dienic aldehydes having the formula:



wherein R_1, R_2, R_3, R_4, and R_6 are selected from the group consisting of hydrogen and lower alkyl groups having from one to about five carbon atoms and R_5 is a lower alkyl group having from one to about five carbon atoms, which comprises hydrogenating the dienic aldehyde in the presence of a palladium metal catalyst, alkali, and water, the improvement which comprises carrying out the hydrogenation at a temperature within the range from about 5° to about 200°C, and at a pressure within the range from atmospheric pressure to about 500 psi, in the presence of a palladium metal catalyst in an amount within the range from about 0.001 g to about 1 g of palladium metal per 100 g of dienic aldehyde with a lower alkanol having from one to about five carbon atoms in a liquid aqueous alkaline reaction medium, the alkali being in an amount within the range from about 0.05 to about 5% by weight of the dienic aldehyde, and the alkanol being in an amount within the range from about 10 to about 200% by weight of the dienic aldehyde.

3,971,831

PROCESS FOR THE SEMIHYDROGENATION OF CITRAL TO CITRONELLAL

Emile Mourier, Sainte-Foy-Les-Lyon, France, assignor to Rhone-Poulenc S.A., Paris, France

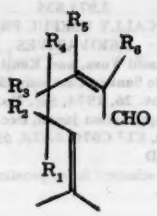
Filed May 2, 1973, Ser. No. 356,677

Claims priority, application France, May 4, 1972, 72.15883

Int. Cl.² C07C *47/20*

U.S. Cl. 260—601 R **15 Claims**

1. In the process for the selective hydrogenation of the olefinic group in a conjugated position to the carbonyl group in dienic aldehydes having the formula:



wherein R_1,R_2,R_3,R_4 and R_6 are selected from the group consisting of hydrogen and lower alkyl groups having from one to about five carbon atoms and R_5 is a lower alkyl group having from one to about five carbon atoms, which comprises hydrogenating the dienic aldehyde in the presence of a palladium metal catalyst, alkali and water, the improvement which comprises carrying out the hydrogenation at a temperature above about 10°C and at a pressure within the range from atmospheric pressure to about 500 psi in the presence of a palladium metal catalyst in an amount within the range from about 0.001 g to about 1 g of palladium metal per 100 g of dienic aldehyde in solution in a lower alkanol having from one to about five carbon atoms with an alkali or alkaline earth metal salt of a boric acid in an amount of at least about 0.05% up to about 5% by weight of the dienic aldehyde, the alkanol being in an amount within the range from about 10% to about 200% by weight of the dienic aldehyde, in the presence of at most 0.1% water.

3,971,832

PROCESS FOR PRODUCING ORTHO-METHYLPHENOLS

Yoshihisa Watanabe; Makoto Takeda, and Makoto Imanari, all of Ami, Japan, assignors to Mitsubishi Petrochemical Company Limited, Japan

Continuation of Ser. No. 164,139, July 19, 1971, abandoned. This application Apr. 10, 1974, Ser. No. 459,849

Claims priority, application Japan, July 17, 1970, 45-62682

Int. Cl.² C07C *214/32*

U.S. Cl. 260—621 R **4 Claims**

1. A process for the ortho-methylation of phenols selected from the group consisting of phenol, o-cresol, m-cresol, 2,3-xylenol, and 2,5-xylenol with methanol in the vapor phase, to produce o-methylphenols which comprises contacting the vaporized phenol with methyl alcohol at a temperature in the range 250°C to 500°C in the presence of an orthomethylating catalyst, the catalytic active of which essentially consists of a pre-baked trimanganese tetroxide previously baked at a temperature in the range 950°C to 1500°C.

3,971,833

METHOD FOR THE PREPARATION OF ALCOHOL-FREE ALKALI AND ALKALINE EARTH METAL ALCOHOLATES

Arnold Lenz, Cologne-Stammheim, and Walter Rogler, Bonn, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed June 25, 1974, Ser. No. 482,977

Claims priority, application Germany, July 2, 1973, 2333634

Int. Cl.² C07C *31/30*

U.S. Cl. 260—632 A **16 Claims**

1. A process for the preparation of an alcohol-free alkali or alkaline earth metal alchoholate dissolved in an inert hydrocarbon solvent which comprises contacting at least an equimolar amount of an alkali or alkaline earth metal in an inert hydrocarbon solvent, which solvent is inert to said alkali or alkaline earth metal, with a monovalent C_1–C_{34} alcohol at an elevated pressure equivalent to autogenous pressure and at a temperature of at least 160°C and below the temperature at

which alkali or alkaline earth metal alcoholate decomposes under the prevailing pressure.

3,971,834

MODIFIED ACRYLATE RESIN

Christopher W. Uzelmeier, Laurel Springs, and Paul D. Jones, Cherry Hill, both of N.J., assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 27, 1975, Ser. No. 562,513
Int. Cl.² C08L *63/02*
U.S. Cl. 260—837 R **6 Claims**

1. An ultraviolet curable acrylate resin composition with improved adhesion to metal surfaces consisting essentially of a reaction product of (i) a secondary monoamine selected from the group consisting of dimethylamine, diethylamine, methylethylamine, diisopropylamine, piperidine, toluidine, diallylamines, methylcyclohexyl amine, N-methyhydroxyl amine, methylethanolamine, butylethanolamine, N-acetylethanolamine and phenylethanolamine, (ii) acrylic acid and (iii) a polyepoxide in a ratio of between about 0.2 and about 0.9 chemical equivalents of the monoamine per chemical equivalent of the polyepoxide and between about 0.8 and about 0.1 chemical equivalents of the acrylic acid per chemical equivalent of the polyepoxide wherein said polyepoxide is a glycidyl ether of 2,2-bis(4-hydroxyphenyl)propane and wherein said reaction product is prepared by contacting components (i), (ii) and (iii) at reaction temperatures of about 125°F to about 200°F.

3,971,835

VINYL HALIDE POLYMER IMPACT MODIFIERS

Robert M. Myers, Philadelphia; David L. Dunkelberger, Levittown, both of Pa., and Daniel T. Carty, Willingboro, N.J., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation of Ser. No. 184,913, Sept. 29, 1971, abandoned, which is a continuation-in-part of Ser. No. 56,007, July 17, 1970, abandoned. This application Aug. 5, 1974, Ser. No. 494,810
Int. Cl.² C08L *51/00*
U.S. Cl. 260—876 R **9 Claims**

1. A modified composition of vinyl halide polymer comprising about 60 to 98 weight percent poly(vinyl halide) and about 2 to 40 weight percent of a three stage, sequentially produced graft polymer comprising

A. 5 to 50 parts by weight of a non-rubbery, hard stage polymer formed by polymerization of a monomer charge of 50 to 100 weight percent of a vinylaromatic compound, 0 to 50 weight percent of a different monovinylidene monomer interpolymerizable therewith, and 0.1 to 10 weight percent of a polyfunctional cross-linking monomer based on the weight of the monomer charge:

B. 20 to 70 parts by weight of a second stage rubbery polymer (A) formed by sequentially polymerizing in the presence of the hard polymer Stage (A), a second monomer of 50 to 100 weight percent of an alkyl acrylate or mixtures thereof wherein the alkyl group of the alkyl acrylate has about 2 to 8 carbon atoms, 0 to 50 weight percent of a monovinylidene monomer interpolymerizable therewith, and 0.2 to 6.0 weight percent of a polyfunctional cross-linking monomer, and

C. 15 to 40 parts by weight of a third stage polymer formed by sequentially polymerizing in the presence of the Stage (A) and Stage (B) polymer product, a monomer charge of 50 to 100 weight percent of an alkyl methacrylate wherein the alkyl group has about 1 to 4 carbon atoms, and 0 to 50 weight percent of a vinylidene monomer interpolymerizable therewith and 0 to 1.0 weight percent of an alkyl mercaptan of 3 to 12 carbon atoms, and 0 to 10 weight percent of a polyfunctional crosslinking monomer further characterized in that the refractive index of the first two stages of the graft polymer is substantially equal to the refractive index of the poly(vinyl halide).

3,971,836

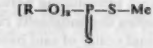
AMINE-STABILIZED DIALKYL DITHIOPHOSPHATES

Lawrence Evans Strow, and Franklin Anderson Bolth, both of Baltimore, Md., assignors to Minerec Corporation, New York, N.Y.

Filed Aug. 16, 1974, Ser. No. 497,905
Int. Cl.² C07F *9/17*
U.S. Cl. 260—963 **6 Claims**

1. A storage-stable flotation promoter comprising:

an aqueous solution of a dialkyl dithiophosphate of the following general formula:



where R is an alkyl group having 3 to 6 carbon atoms and Me is a disassociating cation, said solution being neutralized with caustic sufficient to remove all initial acidity; and

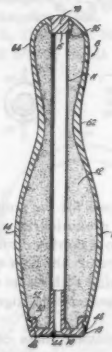
0.5 to 5% by weight of a trialkyl amine.

3,971,837

PROCESS FOR MANUFACTURING A COMPOSITE FOAMED SYNTHETIC RESIN BOWLING PIN

Tadashi Hasegawa, 3 Tsukimigaoka Yatomi-cho, Mizuho, Nagoya, and Tetsuo Yamaguchi, 57 Hatama Oota-cho, Tokai, both of Japan

Filed Sept. 10, 1973, Ser. No. 395,830
Int. Cl.² B29D *27/00*
U.S. Cl. 264—46.6 **7 Claims**



1. In a method for producing a bowling pin having a substantially rigid tube, a base support element composed of a flattened disc, one surface of which is modified to form an axially aligned collar and sleeve, to which sleeve is secured one end of said tube, said collar and sleeve being disposed coaxially about an orifice in said disc; said collar being formed in a position intermediate between said sleeve and the outer periphery of said disc, and terminating in a transversely disposed cylindrical flange having a diameter less than that defined by the outer periphery of said disc; a body of expanded resin surrounding said tube and disposed within said collar and the upper surface of the foregoing disc; a shell of solid thermoplastic resin disposed about said body and continuous with the outer periphery of the disc and in interlocking engagement with said disc and flange of said base support element said method comprising the steps of securing said one end of said tube on the sleeve and about the central orifice of said base support element; centering said tube and base support element within a first mold having the contour of an undersized bowling pin in such manner that the outer surface of said disc is in contact with the inner wall of said mold at one end

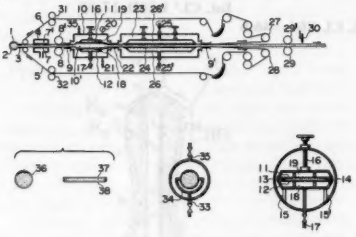
thereof and the outer peripheries of said disc and collar are disposed in recesses in said mold and introducing a foamable thermosetting resin reaction mixture into said mold and about the length of said tube and within the confines of said collar on said base support element; foaming and curing said resin and removing the resulting assembly from said first mold; centering said assembly in a second mold wherein the outer surface of said disc is disposed in contact with an inner end wall of said second mold, said second mold having a larger cross-sectional diameter than said first mold and having a contour similar to that of said first mold so that said assembly is, as a result, in spaced relationship to the interior side walls of said second mold; and, introducing between said side walls and said assembly a molten thermoplastic resin to provide said shell interlocked with said collar of said base support element.

3,971,838

PROCESS FOR CONTINUOUSLY PRODUCING SHAPED ARTICLES OF POLYSTYRENE FOAM

Masahide Yazawa, Tokyo, Japan, assignor to Polymer Processing Research Institute Ltd., Tokyo, Japan

Filed Aug. 17, 1973, Ser. No. 389,406
Claims priority, application Japan, Aug. 18, 1972, 47-82559
Int. Cl.² B29D *27/00*
U.S. Cl. 264—51 **7 Claims**



1. In the known process for the continuous production of a foam product wherein preliminarily expanded beads of polystyrene are formed into a confined moving mass, moving the confined mass of the beads through a heating zone wherein the mass is directly heated with steam so as to cause said mass of beads to reexpand and adhere together, the improvement which comprises:

a. enveloping the moving mass of the preliminarily expanded beads of polystyrene so as to cover the top, bottom and lateral side surfaces thereof with at least one steam permeable cloth belt having a sufficient width to form overlapping parts of the cloth belt around the exterior surface of the mass of beads,

b. causing said mass of beads enveloped in steam permeable cloth belt to move through a pressurized steam heating zone which is provided with a pressure sealing zone on both the inlet and the outlet openings thereof,

c. applying mechanical pressure to said enveloped mass of beads at a point adjacent to the inlet of said pressurized steam heating zone so as to prevent the mass of beads in said envelope from flowing backwards through the enveloping cloth belt,

d. retaining the enveloped mass of beads in said pressurized steam heating zone for a long enough time to cause reexpansion of the mass of beads,

e. reducing the reexpanded volume of the mass of beads prior to leaving the pressurized steam heating zone so as to secure the mutual firm adhesion of the beads and to achieve a definite shape for the foamed mass leaving the pressurized steam heating zone,

f. applying mechanical pressure to the enveloped foamed mass at a point adjacent to the outlet of the pressure sealing zone so as to minimize the leakage of steam from said pressurized steam heating zone,

g. cooling the enveloped foamed mass, and

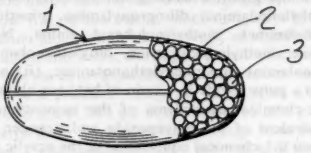
h. separating the enveloping cloth belt from the foamed mass and recovering as a final product a foamed mass of polystyrene.

3,971,839

PARTICLE FILLED SELF-CONFORMABLE CUSHION AND METHOD OF MAKING SAME

Don A. Taylor, Box 4, Wadsworth, Ohio 44281

Filed Dec. 6, 1971, Ser. No. 204,972
Int. Cl.² D04H *1/54*; B29C *6/02*
U.S. Cl. 264—112 **9 Claims**



1. A method of making a cushioning structure comprising:

supporting in loosely packed condition in a confining space a charge of discrete particles which are composed of raw thermo-meltable material and which are in a size range upwardly from about powder size and to large enough so that each particle is readily distinguishable visually by the unaided eye as an individual particle separate and apart from the other particles;

applying heat under controlled temperatures and time to the charge to melt those of the particles at the surface of the charge, and for a predetermined distance inwardly from the surface of the charge, at selected areas of the surface of the charge while limiting the heating so that the particles farther inwardly remain in their original and unmelted condition; and

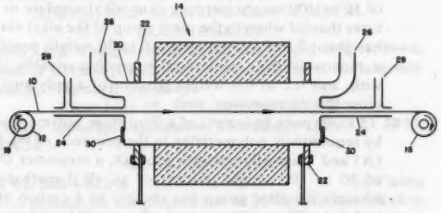
applying molding pressure to the exterior of the charge at said areas while said melted particles are in melted condition to shape the melted material into a covering encapsulating at least in part the unmelted particles.

3,971,840

PRODUCTION OF HIGH STRENGTH CARBIDE FIBERS BY HEAT TREATMENT

James Economy, Eggertsville; Ruey Y. Lin, Williamsville, and William D. Smith, Tonawanda, all of N.Y., assignors to The Carborundum Company, Niagara Falls, N.Y.

Filed Mar. 27, 1973, Ser. No. 345,376
Int. Cl.² B29C *25/00*
U.S. Cl. 264—231 **5 Claims**



1. A process for strengthening a curled carbide-containing fiber, said fiber comprising a material selected from the group consisting of carbides of boron, chromium, molybdenum, hafnium, zirconium, tantalum, niobium, and mixtures thereof, comprising the steps of:

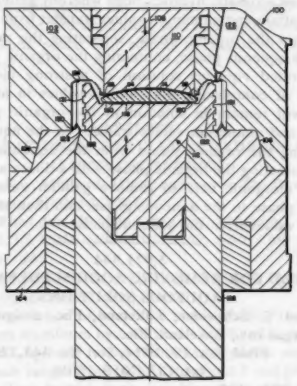
1. heating, at a temperature in the range of about 2050°C to about 2300°C, for a period of about 0.2 to about 10 minutes, the curled carbide-containing fiber while, simultaneously,
2. subjecting the curled carbide-containing fiber to tensile stress in the range of about 200 to about 3500 psi to essentially remove internal fiber stresses, straighten the fiber and thereby increase the tensile strength of the carbide-containing fiber.

3,971,841

MOLDING DEVICES AND PROCESS FOR MAKING A MOLDED PLASTIC LENS MOUNT

Leon Rubinstein, Natick, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed June 20, 1974, Ser. No. 481,128
Int. Cl.² B29C *1/14*; B29D *11/00*
U.S. Cl. 264—275 **19 Claims**



1. A molding device for forming a molded plastic lens mount having an uncentered lens element insert molded and centered therein such that the optical axis of the uncentered lens element coincides with a geometrical axis of the mount, the mount being of the type including intergrally molded means for retaining the uncentered lens element by the periphery thereof and a cylindrical wall having an axially disposed helical screw thread integrally molded therewith for coupling the lens mount to another lens mount having a complementary screw thread thereon, said molding device comprising:

a cavity mold including first and second mold sections movable relative to one another between an open position and a closed position wherein said first and second mold sections are aligned, on a common geometrical axis of said mold, in abutting relation, said first and second mold sections are aligned, on a common geometrical axis of said mold, in abutting relation, said first and second mold sections including cooperating means therein for defining an internal cavity within said closed mold into which plastic may be injected to form the mount, said cavity being complementary in shape to the shape of the molded plastic mount and being disposed within said closed mold such that the geometrical axis of the mount coincides with said geometrical axis of said mold;

said means for defining said cavity including first and second opposed zonal clamps mounted, on said geometrical axis of said mold, said first and second zonal clamps including low friction rings on their respective opposed ends for engaging opposite optical surfaces of the uncentered lens element, said first zonal clamp being mounted for axial displacement towards said second zonal clamp, when said mold is in said closed position and prior to the injection of the plastic, for causing said low friction rings to exert a compressive force on the uncentered lens element thereby displacing the uncentered lens element in directions transverse to said geometrical axis of said mold until the optical axis of the uncentered lens element is coincident with said geometrical axis of said mold and said second zonal clamp being mounted for both axial rotation and displacement to facilitate release of the molded plastic mount from said mold subsequent to the forming of the mount and when said first and second mold sections are in said open position;

said means defining said cavity including surfaces within said closed mold which form the retaining means around the periphery of the uncentered lens element held by said zonal clamps for retaining the uncentered lens element in the mount, and surfaces which form the cylindrical wall and the helical screw thread thereon, when plastic is injected into the mount; and

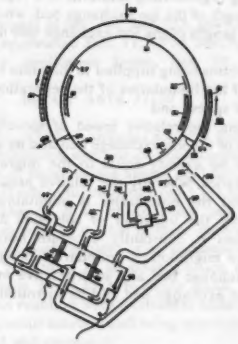
means in at least one of said first and second mold sections for holding the molded plastic mount subsequent to the injection of plastic such that said second zonal clamp, mounted for axial rotation and displacement, may be rotated and displaced to disengage the molded mount and said mold surface forming the helical screw thread to facilitate the release of the molded mount from said mold.

3,971,842

CONTINUOUS DISPLACEMENT CHROMATOGRAPHIC SEPARATION

John R. Ewbank, Southampton, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 8, 1974, Ser. No. 495,695
Int. Cl.² C22B *60/02*; B01D *15/08*, *33/00*
U.S. Cl. 423—7 **7 Claims**



2. In a method in which an ion exchange bed is employed for separating a mixture by preferential sorption rates in an ion exchange bed having a significant length relative to a cross sectional dimension, there being a plurality of regions along the length of said ion exchange bed, one of said regions being a separation region, the improvement which consists of:

surrounding the ion exchange bed with a chamber having a plurality of modifying zones in which solutions are withdrawn, injected, or pressurized, each modifying zone permitting flow of solutions between the core of the bed and the liquid transfer zone adjacent the sidewalls of the bed without substantial distortion of the desired cross sectional patterns of the liquid flow along the length of the bed;

withdrawing from a zone adjacent the front boundary of said separation region, a solution containing increased concentrations of ions of a selected component of said mixture, such increased concentration being attributable to chromatographic displacement phenomena and such solution withdrawal being from side walls of the ion exchange bed, there being no liquid flow to or from end walls of the ion exchange bed;

withdrawing from a zone adjacent a rear boundary of the separation region a solution containing a controlled decreased concentration of ions of said selected component, such decreased concentration being attributable to chromatographic displacement phenomena, such solution withdrawal being to sidewalls of the ion exchange bed, there being no liquid flow to or from end walls of the ion exchange bed;

feeding to an intermediate portion of the separation region a stream of a solution containing the mixture of ions to be separated at a rate totaling the rates of withdrawal from said boundaries, the total liquid flow through the separation region being several times said rate of feeding the mixture to be separated, the large ratio of total liquid flow to feed flow in the separation region being attributable to chromatographic displacement phenomena, such solution feeding being to side walls of the ion exchange bed, there being no liquid flow to or from end walls of the ion exchange bed;

supplying to a region in advance of the separation region a solution for the maintenance of an appropriate chemical reaction at the constantly advancing front boundary of the separation region;

supplying to a region rearward of the separation region a solution, a portion of which solution flows forwardly to provide a chemical reaction at the rear boundary of the constantly advancing separation region, the length of the separation region remaining substantially constant because the migration speeds of the front and rear boundaries are substantially identical;

supplying regenerating solutions to a regenerating region of the length of the ion exchange bed, whereby each portion of the length of the ion exchange bed may be repetitively used;

said solutions being supplied to maintain the speed of migration of the boundaries of the separation region at a controlled speed; and

controlling the relative speed of movement between the length of the ion exchange bed and its surrounding chamber to be exactly equal to the migration speed of the boundaries, whereby the relative positions of the chamber and the boundaries is maintained stationary, and whereby the injection of solutions and withdrawal of solutions is constantly accurate notwithstanding such relative migration of boundaries along the length of the ion exchange bed and such relative movement between the ion exchange bed and its surrounding chamber.

3,971,843
PROCESS FOR LIQUID/LIQUID EXTRACTION OF GALLIUM

Jacques Helgorsky, Frepillon, and Alain Leveque, Paris, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed July 3, 1975, Ser. No. 592,884

Claims priority, application France, July 12, 1974, 74.24263; Apr. 10, 1975, 75.11200; Apr. 16, 1975, 75.11797

Int. Cl.² C01G *15/00*; C01F *7/02*

U.S. Cl. 423—112 **12 Claims**

1. The process for the recovery of gallium present as a compound in solution in aqueous alkaline solutions which also contain compounds of aluminum and sodium in solution comprising contacting the aqueous solution with a water-insoluble, organic solvent-soluble substituted hydroxyquinoline in solution in a water immiscible organic solvent selected from the group consisting of halogenated and unhalogenated aliphatic and aromatic hydrocarbons whereby gallium and some of the sodium and aluminum values transfer from the aqueous phase into the organic phase, separating the organic phase from the aqueous phase, contacting the organic phase with a dilute aqueous solution of an inorganic acid to remove sodium and aluminum to the aqueous phase, leaving gallium values in solution in the organic phase, separating the organic phase from the aqueous phase, and then contacting the remaining organic phase with an aqueous solution of a more concentrated inorganic acid to remove gallium values from the organic phase to the aqueous phase, and then separating the gallium values from the aqueous phase.

11. The process for the recovery of gallium present as a compound in solution in aqueous alkaline solution which also contains compounds of aluminum and sodium in solution comprising contacting the aqueous solution with a water insoluble, organic solvent soluble substituted hydroxyquinoline in solution in a water immiscible organic solvent selected from the group consisting of halogenated and unhalogenated aliphatic and aromatic hydrocarbons whereby gallium and some of the sodium and aluminum values transfer from the aqueous phase into the organic phase, separating the organic phase from the aqueous phase, contacting the organic phase with a concentrated aqueous solution of a strong inorganic acid capable of complexing the gallium values in anionic form, which will remain in solution in the organic phase, while sodium and aluminum values transfer to the aqueous phase, separating the organic phase from the aqueous phase, and then contacting the organic phase with a dilute aqueous solution of inorganic acid to remove gallium values from the organic phase to the aqueous phase, and then separating the gallium values from the aqueous phase.

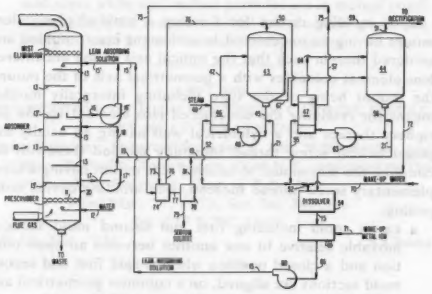
3,971,844
METHOD FOR REMOVING SODIUM SULFATE FROM AQUEOUS SOLUTIONS

Raymond T. Schneider, Lakeland, Fla., assignor to Davy Powergas Inc., Lakeland, Fla.

Filed Feb. 19, 1974, Ser. No. 443,326

Int. Cl.² C01B *17/00*

U.S. Cl. 423—182 **9 Claims**



1. In a process for removing sulfur dioxide from a sulfur dioxide-containing gas in a sulfur dioxide removal system comprising containing the gas in an absorption zone with an aqueous absorbing solution of sodium sulfite to absorb sulfur dioxide, and the solution contains sodium disulfite and sodium sulfate, and desorbing sulfur dioxide from said resultant aqueous solution in a desorption zone, the improvement comprising withdrawing a sufficient portion of the aqueous solution from the sulfur dioxide removal system to avoid an unduly high concentration of sodium sulfate in the aqueous solution, treating the withdrawn solution having an *s/c* of about 0.7:1 to 0.95:1 with sulfur dioxide for a period of time sufficient to provide an increase in the *s/c* of at least about 0.02:1 and the *s/c* of the withdrawn aqueous solution, after contact with the sulfur dioxide, is about 0.85:1 to 1:1 crystallizing and separating sodium sulfate from said treated withdrawn solution, and

passing the resultant mother liquor to the sulfur dioxide removal system.

3,971,845

RECOVERY OF HYDROFLUORIC ACID FROM AQUEOUS FLUOSILICIC ACID

Wolf Becker, and Wolfgang Weiss, both of Cologne, Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Sept. 26, 1973, Ser. No. 400,810

Claims priority, application Germany, Sept. 30, 1972, 2248149

Int. Cl.² C01B *33/08, 33/10, 33/12, 7/22*

U.S. Cl. 423—483 **5 Claims**

1. A process for recovering hydrofluoric acid from aqueous fluosilicic acid consisting essentially of water and fluosilicic acid which comprises heating said aqueous fluosilicic acid at a temperature of from 100° to 300°C. and under a pressure of from 7 to 80 atmospheres gauge to obtain a hydrogen fluoride containing aqueous phase and a silicon tetrafluoride containing gaseous phase and separating said hydrogen fluoride containing aqueous phase and silicon tetrafluoride containing gaseous phase.

3,971,846

PREPARATION OF BERYLLIUM HYDRIDE AND ALUMINUM HYDRIDE

James S. Skelcey, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 30, 1964, Ser. No. 342,850

Int. Cl. C01b *6/00;* **C01f** *1/00, 3/00, 7/00*

U.S. Cl. 423—645 **3 Claims**

1. A novel process for preparing beryllium hydride and aluminum hydride which comprises:

a. adding a solution of beryllium borohydride to a solution of lithium aluminum hydride such that the ratio of lithium aluminum hydride to beryllium borohydride on a gram mole basis ranges from about 2 to about 5 and precipitating beryllium hydride in the resulting mixture, the solvent for said lithium aluminum hydride and beryllium borohydride being a liquid material inert to the reactants and products and dissolving said beryllium borohydride and lithium aluminum hydride but being a substantially nonsolvent for beryllium hydride,

b. separating said solid beryllium hydride from the reaction mass,

c. stripping said solvent from the residual reaction mixture,

d. heating the resulting substantially dry product mass at an elevated temperature of from about 45° to about 140° C. for a period of from about 0.25 to about 24 hours, and

e. recovering a substantially ether free, ether-insoluble aluminum hydride of hexagonal crystal structure.

3,971,847

HYDROGEN-RICH GAS GENERATOR

John Houseman, Pasadena, Calif., assignor to The United States of America as represented by the Adminstrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 428,444, Dec. 26, 1973, Pat. No. 3,920,416. This application Feb. 27, 1975, Ser. No. 553,687

Int. Cl.² C01B *1/13*

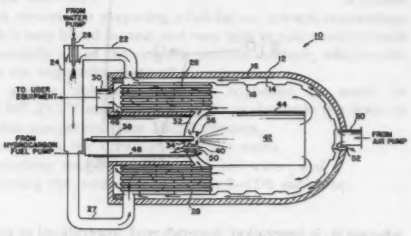
U.S. Cl. 423—650 **1 Claim**

1. A method of generating a hydrogen rich gas in a hydrogen generator having a partial oxidation region comprising

introducing a liquid hydrocarbon fuel in the form of a spray into said partial oxidation region,

preheating air with the heat generated as a result of igniting the hydrocarbon fuel spray, injecting water into said preheated air to form a mixture of steam and air, further heating indirectly said mixture of steam and air,

mixing said further heated steam and air with said hydrocarbon fuel spray within said partial oxidation region,



igniting said hydrocarbon fuel spray mixed with said steam and air within said partial oxidation region to form a hydrogen rich gas, and

removing all of said hydrogen rich gas from said partial oxidation region.

3,971,848

LUBRICATING COMPOSITION FOR MUCOSA OR EPIDERMIS

Fumio Kasahara, Chiba, and Kazuo Takeshita, Fujisawa, both of Japan, assignors to Kimitsu Chemical Laboratory Co. Ltd. and Showa Yakuhinkako Kabushiki Kaisha, both of, Japan

Continuation-in-part of Ser. No. 209,733, Dec. 20, 1971, abandoned. This application Feb. 11, 1974, Ser. No. 441,503

Claims priority, application Japan, Dec. 21, 1970, 45-114920

Int. Cl.³ A61K *31/70*

U.S. Cl. 424—180 **4 Claims**

1. A composition which in aqueous solution forms a mucosal or epidermal lubricant, said composition consisting essentially of a mixture of fucoidin and alginic acid salt in a weight ratio of alginic acid salt to fucoidin of from 1.6:1 to 3.6:1, said fucoidin being obtained from phaephyceae and comprisng principally calcium salts of methyl pentose monosulfate and glucose monosulfate, said fucoidin being decomposed by acid, being capable of remaining in aqueous solution in the presence of calcium salts, being inert to dilute alkali, forming an insoluble salt upon reaction with a trivalent metal, forming a mucilageneous squeous solution and being sparingly soluble in methanol, ethanol and propanol.

3,971,849

1,N⁶-ETHENO-5'-ADENOSINE CARBOXYLATES FOR INCREASING CORONARY SINUS PARTIAL PRESSURE OF OXYGEN

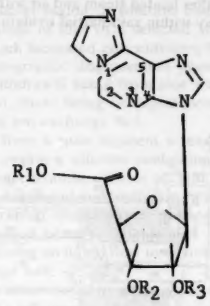
Raj Nandan Prasad, Pierrefonds, and David Lyon Garmaise, Montreal,both of Canada, assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 317,325, Dec. 21, 1972, Pat. No. 3,830,795. This application May 21, 1974, Ser. No. 471,940

Int. Cl.² A61V *31/70*

U.S. Cl. 424—180 **2 Claims**

1. A method of increasing coronary sinus partial pressure of oxygen in a patient in need of such treatment comprising administering an effective coronary sinus partial pressure of oxygen increasing amount of a compound of the formula



wherein R_1 is loweralkyl, loweralkenyl, loweralkynl or cycloalkyl of 3 to 6 carbon atoms; and R_2 and R_3 each are hydrogen, acetyl, propionyl or butyryl, or R_2 and R_3 taken together form isopropylidene or benzylidene; or the pharmaceutically acceptable acid addition salts thereof to said patient.

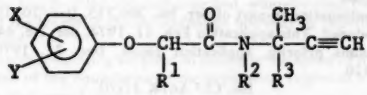
3,971,850

N-SUBSTITUTED-N-(1-SUBSTITUTED-1-METHYL-2-PROPYNYL)-α-(SUBSTITUTED PHENOXY) ALKYLAMIDES AND THEIR USE AS MITICIDES

Don R. Baker, Orinda, and Francis H. Walker, Mill Valley, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed June 30, 1975, Ser. No. 591,665
Int. Cl.² A01N 9/20; C07C 103/19
U.S. Cl. 424—324 **18 Claims**

1. A compound having the formula



wherein X is either fluorine or trifluoromethyl; Y is either hydrogen or chlorine; R^1 is either methyl or ethyl; and where X is fluorine, R^2 is hydrogen and R^3 is methyl; and where X is trifluoromethyl, R^2 and R^3 are independently selected from the group consisting of hydrogen and methyl.

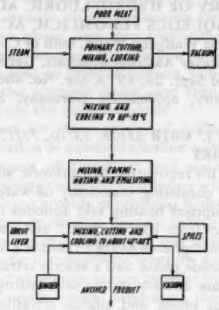
3,971,851

METHOD OF MAKING LIVERWURST

Friedrich Otto, Hameln, Weser, Germany, assignor to A. Stephan u. Sohne, Hameln, Weser, Germany

Filed Dec. 19, 1974, Ser. No. 534,510
Claims priority, application Germany, Dec. 24, 1973, 2364485
Int. Cl.³ A23K 1/00
U.S. Cl. 426—646 **8 Claims**

1. A rapid method of making liverwurst, liver paste and the like, comprising the steps of continuously agitating pork trimmings in a vessel while subdividing them into a mass of chunks of initial size; admitting saturated steam into the presence of the mass contained in said vessel to cook the mass while continuing the agitation; terminating the cooking when the mass in said vessel reaches a temperature of about 125°C, and thereupon cooling the agitated mass in said vessel to about 60°–95°C; maintaining a vacuum condition in said vessel until said mass has been heated to a temperature of about 80°C by said steam; comminuting and emulsifying the cooled mass in said vessel while continuing the agitation until said chunks are reduced to a final size smaller than said initial size; admitting liver pieces and binder material into the emulsified agitated mass in said vessel and effecting comminution of the liver pieces while continuing the agitation and further cooling the



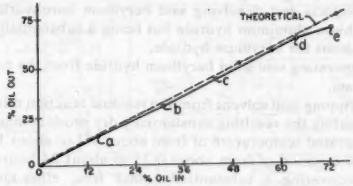
resulting mixture in said vessel to about 40°–80°C; and admitting spices into the mixture in said vessel to obtain a spiced product.

3,971,852

PROCESS OF ENCAPSULATING AN OIL AND PRODUCT PRODUCED THEREBY

Joseph Brenner; Gary H. Henderson, both of Middletown, and Robert W. Bergensten, Kerhonkson, all of N.Y., assignors to Polak's Frutal Works, Inc., Middletown, N.Y.

Filed June 12, 1973, Ser. No. 369,306
Int. Cl.² A23L 1/06; A61K 7/46; B01J 13/02
U.S. Cl. 426—103 **12 Claims**



2. The process of encapsulating an oil in a solid matrix comprising a mixture of a hydrolyzed starch and a polyhydroxy compound present in an amount at least 20% of the mixture and selected from the group consisting of alcohols, plant-type sugars, lactones, monoethers and acetals which comprises forming a solution of the modified starch and the polyhydroxy compound in water, emulsifying the oil in said solution and spray drying said emulsion to remove water therefrom.

3. A composition consisting essentially of a water-soluble cellular matrix of hydrolyzed starch and at least one other polyhydroxy compound and having globules of oil in the cells thereof, said other polyhydroxy compound being at least about 20% of the matrix by weight and being a water-soluble member selected from the class consisting of alcohols, plant-type sugars, lactones, monoethers and acetals said composition having been produced by the process of claim 2.

10. A composition according to claim 3 in which the oil is a flavor oil.

3,971,853

FROZEN CONFECTION AND METHOD AND APPARATUS FOR MAKING SAME

John V. Crowder, Bethpage, N.Y., assignor to Consolidated Foods Corporation, Chicago, Ill.

Filed Dec. 29, 1970, Ser. No. 102,411
Int. Cl.² A23G 9/04, 9/24, 9/26
U.S. Cl. 426—249 3 Claims

1. A method of making a frozen confection from a plurality of ingredients comprising the steps of providing first and second normally liquid ingredients having first and second colors, reducing said first and second ingredients to a substantially frozen form, conveying said first and second ingredients to a nozzle with said first ingredient being arranged within said second ingredient, directing said first ingredient laterally of its flow path into said second ingredient to substantially intermix them, introducing a third normally liquid ingredient in its substantially liquid state to a portion of the interface between said second ingredient and said nozzle, and discharging all of said ingredients into a mold.

3,971,854

METHOD OF PRODUCING FREEZE-DRIED, COOKED BEEF STEAK AND RESULTING PRODUCT

Larry C. Hinnergardt, Franklin, Mass., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 22, 1975, Ser. No. 643,203
Int. Cl.² A23L 1/31
U.S. Cl. 426—281 6 Claims

1. Method of producing freeze-dried, cooked beef steaks which are rapidly rehydratable and which are tender and juicy following rehydration which comprises, mechanically tenderizing beef muscle by penetrating the beef muscle from which said beef steaks are to be prepared by inserting sharp, narrow cutting means into and through said beef muscle at least one time, withdrawing said cutting means from said beef muscle, pumping into said beef muscle at a plurality of substantially equally spaced apart points an aqueous solution containing from about 3.0 to about 5.0 percent sodium tripolyphosphate and from about 5.0 to about 10.0 percent sodium chloride until said beef muscle has absorbed from about 8 percent to about 12 percent of said aqueous solution, freezing said beef muscle containing said aqueous solution, cutting said beef muscle into slices suitable for cooking as steaks, cooking said slices to produce cooked beef steaks, freezing said cooked beef steaks, and freeze-vacuum-dehydrating said cooked beef steaks to a moisture content less than about 2.0 percent.

3,971,855

PREVENTION OF FUNGI AND MOLDS IN POULTRY AND ANIMAL FEEDSTUFFS WITH METHYL ROSANILINE CHLORIDE ADDITIVE

Dennis E. Jackson, Springfield, Mo., assignor to Naremco, Inc., Springfield, Mo.

Division of Ser. No. 307,372, Nov. 17, 1972, abandoned. This application Dec. 11, 1974, Ser. No. 531,720
Int. Cl.² A23K 3/00
U.S. Cl. 426—321 5 Claims

1. A poultry or animal feed product protected against microbial activity, fungi and mold growths, comprising a basal feed ration containing ground feed materials in intimate admixture with a substantially dry, finely-divided, non-toxic, mineral carrier having from about 0.05% to 5.0% by weight of methylrosaniline chloride dispersed thereon, said mineral carrier having incorporated therein by adsorption or reaction from about 0.1% to 10% by weight of a non-toxic acid based on the weight of the carrier, said acid being one which is adsorbed by or forms water soluble reaction products with said carrier, to thereby facilitate the release of said methylrosaniline chloride from the carrier in the presence of moisture.

3,971,856

PROCESS FOR PREPARING SOY PROTEIN CONCENTRATE

Rasik D. Daftary, Decatur, Ill., assignor to Archer Daniels Midland Company, Decatur, Ill.

Filed Mar. 3, 1975, Ser. No. 554,572
Int. Cl.² A23J 1/14, 3/00; A23L 1/20
U.S. Cl. 426—417 5 Claims

1. A process for preparing a full-fat soy protein concentrate which is very bland in taste and very light in color and contains substantially all of the original protein content, which comprises the sequential steps of:

1. adding dehulled, cracked soybeans to water at 180°–212°F and maintaining the soybeans in the water at that temperature for 10–50 minutes,
2. removing the soybeans from the water,
3. washing the soybeans in fresh hot water, and
4. drying the washed soybeans to 8–15% moisture.

3,971,857

MULTIFUNCTIONAL SWEETENING COMPOSITION

Ivan Fruda, Pleasantville, and Jerome Francis Trumbetas, Tarrytown, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Nov. 21, 1973, Ser. No. 418,015
Int. Cl.² A23L 1/236
U.S. Cl. 426—548 9 Claims

1. A process for producing a low calorie sweetening composition which is readily soluble in aqueous systems, low in hygroscopicity and devoid of any aftertaste which alters the sweetness thereof which comprises:

a. forming an aqueous solution of glucose;
b. heating the glucose solution until the glucose is completely solubilized;
c. adding a catalytic amount of phosphoric acid to the heated solution in order to catalyze the polymerization of the glucose;
d. evaporating the heated solution to form an acidified glucose syrup;
e. vacuum heating the acidified glucose solution to obtain a polyglucose residue;
f. forming an aqueous solution of dipeptide sweetener with the polyglucose in a respective weight ratio range of about 1:19 to about 3:7.
g. drying the dipeptide sweetener/polyglucose solution.

3,971,858

EXTRACTING TEA USING AN AQUEOUS SOLUTION OF AMMONIUM BICARBONATE OR AMMONIA

Peter Dudley Collier; Alistair Penman, both of Rushden, and Frederick John Trussell, Ampthill, all of England, assignors to Thomas J. Lipton, Inc., Englewood Cliffs, N.J.

Filed Aug. 30, 1974, Ser. No. 501,955
Claims priority, application United Kingdom, Sept. 5, 1973, 41649/73; Oct. 26, 1973, 50085/73
Int. Cl.² A23F 3/00
U.S. Cl. 426—597 12 Claims

1. A method of obtaining a tea extract containing soluble tea solids in substantially higher yields than obtained by simple hot water extraction, comprising the steps of extracting tea leaves with an aqueous solution of a material selected from the group consisting of ammonium bicarbonate and ammonia to produce an aqueous tea extract, separating the extracted leaves from the aqueous tea extract and discarding the leaves.

3,971,859
TECHNIQUE FOR PREPARING EDIBLE FOOD FLAVOR PELLETS

Eric G. Huessy, Eden Prairie, Minn., assignor to Peavey Company, Minneapolis, Minn.

Continuation of Ser. No. 225,602, Feb. 11, 1972, abandoned. This application July 9, 1974, Ser. No. 486,813
Int. Cl.[2] A23L *1/22*
U.S. Cl. 426—618 **3 Claims**

1. The method of preparing edible food flavoring pellets for incorporation in dry baking mixes and the like which comprises:

a. preparing a homogeneous protein rich mixture with the following formulation:

Ingredient	Percentage
Wheat germ	30 – 50
Soy flour	10 – 30
Sugar	10 – 15
Water	7 – 11
Vegetable oil	4 – 6
Cornstarch	3 – 5
Sorbitol	1 – 3
Artificial flavoring	1 – 5
Sodium chloride	1.90
Lactic acid	0.45
Sodium citrate	0.22

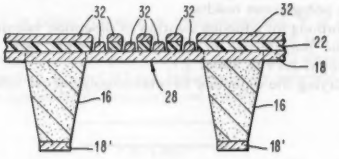
b. separating said formulation into integral pellets; and

c. immersing said integral pellets into a bath of vegetable oil heated to a temperature of between 350° and 400°F. for a period of between about 30 seconds and 100 seconds.

3,971,860
METHOD FOR MAKING DEVICE FOR HIGH RESOLUTION ELECTRON BEAM FABRICATION

Alec N. Broers, Purdy Station, and Thomas O. Sedgwick, Crompond, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 358,186, May 7, 1973, abandoned, which is a division of Ser. No. 158,463, June 30, 1971, abandoned. This application Feb. 26, 1975, Ser. No. 553,184
Int. Cl.[2] B05D *3/06*
U.S. Cl. 427—43 **3 Claims**



1. A method for making devices for high resolution electron beam fabrication comprising the steps of:

coating two parallel surfaces of a semiconductor wafer substrate with first and second layers of a base material on opposing surfaces,

coating said first and second layers of base material with a suitable photoresist material,

exposing the first of said photoresist layers in a predetermined pattern,

developing said exposed photoresist to expose the first of said base material layers in said predetermined pattern,

etching said first base material layer with a suitable etchant to thereby expose the surface of said substrate thereunder in said predetermined pattern,

removing the photoresist layers from said base material layers,

etching the surface of said substrate until it is completely dissolved thereby producing thin windows consisting of the second of said base material layers according to said predetermined pattern,

depositing an electron resist on said second base material layer,

exposing said resist to an electron beam at the location of said thin windows in a predetermined pattern,

developing said resist in said predetermined pattern to expose the surface of said second base material layer, and

depositing a metal on said surface of said second base material layer and thereafter removing the unexposed resist and metal thereon to provide a highly resolved metal pattern on said second base material layer.

3,971,861
ALLOY PLATING SYSTEM

Lionel de Waltoff, La Prairie, Canada, assignor to Handy Chemicals Limited, La Prairie, Canada

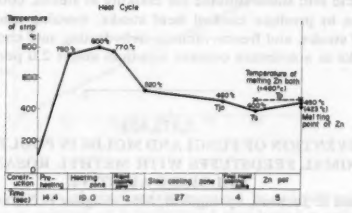
Filed Oct. 25, 1974, Ser. No. 518,170
Int. Cl.[2] C23C *3/02*
U.S. Cl. 427—247 **9 Claims**

1. In an aqueous electroless plating solution containing a nickel salt, a tin salt and a hypophosphite, the improvement which comprises including in said solution thiourea in an amount of at least 1% by weight up to the saturation concentration of thiourea and maintaining the pH value of the solution in the range of about 2 to 5.

3,971,862
CONTINUOUS HOT-DIP GALVANIZING PROCESS FOR STEEL STRIP

Yoshikazu Fukuoka, and Hiroshi Miwa, both of Fukuyama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 386,575, Aug. 8, 1973, abandoned. This application July 7, 1975, Ser. No. 593,186
Claims priority, application Japan, Aug. 10, 1972, 47-79510
Int. Cl.[2] C23C *1/00*
U.S. Cl. 427—329 **3 Claims**



1. In a continuous hot-dip galvanizing process wherein a flux is omitted and wherein a steel strip is annealed in line in a heating furnace at a temperature of more than 750°C., and then the strip is slowly cooled in a furnace having a reducing atmosphere followed by introducing the strip to a molten zinc bath, the improvement which comprises

subjecting said annealed strip to a final rapid cooling following said slow cooling to provide a temperature of the strip from 300° to 460°C. just before it is passed into the molten zinc bath, said temperature being below or equal to the temperature of zinc bath, whereby the formation of dross is substantially reduced.

3,971,863

COATED HEAT FUSIBLE INJECTION MOLDABLE PHENOL-ALDEHYDE PELLETS

Thornton R. Calkins, Pittsfield, Mass., assignor to General Electric Company, Pittsfield, Mass.

Continuation-in-part of Ser. No. 304,016, Nov. 6, 1972, abandoned. This application Aug. 23, 1974, Ser. No. 500,114

Int. Cl.² B32B 27/42

U.S. Cl. 428—407 8 Claims

1. A coated heat fusible thermosettable injection moldable phenol-aldehyde pellet consisting essentially of a phenol-aldehyde resin, crosslinking agents and fillers having a diameter of at least one-sixteenth inch which comprises the pellets having a coating on the surface thereof wherein said coating comprises in admixture (1) a metallic salt of a long chain fatty acid of 8–20 carbon atoms and (2) a material selected from the group consisting of (a) a alkyl ester of an aromatic acid, (b) an alkyl ester of an aliphatic acid, (c) mixtures of (a) and (b), and (d) mixtures selected from the group consisting of (a), (b), and (c) with a material selected from the group consisting of polyglycols, polyglycol esters and mixtures of polyglycols and polyglycol esters; wherein said coating composition contains 0.5 to 10 parts of (2) per 1 part of (1).

3,971,864

POLYURETHANE LAMINATES

William R. Beestrice, New Kensington; Joseph Cherenko, Valencia, and William I. Frey, Curtisville, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sept. 30, 1974, Ser. No. 510,672

Int. Cl.² B32B 27/40

U.S. Cl. 428—423 7 Claims

1. A transparent laminate suitable for use as a window comprising a layer of rigid transparent material selected from the group consisting of glass and rigid transparent plastic materials laminated to a first major surface of a layer of polyurethane having a tendency to bloom and an essentially continuous layer of wax covering the second major surface of said layer of polyurethane, said layer of wax having a minimum thickness sufficient to protect said second major surface from blooming and a maximum thickness less than that which significantly affects the optical quality of the laminate.

3,971,865

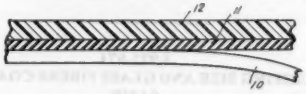
ADHESIVE RESIN COMPOSITION

Masao Murakami; Akio Amaya, and Masaru Kawakita, all of Utsunomiya, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 9, 1975, Ser. No. 566,224

Int. Cl.² C09J 7/02, 3/12, 3/16; B32B 7/12

U.S. Cl. 428—40 20 Claims



1. An adhesive composition comprising in intimate admixture,

A. a nitrile rubber with carboxyl groups

1. said nitrile rubber being a terpolymer comprised of acrylonitrile, butadiene, and on a 100 weight basis, from about 0.5 to 7 weight percent of at least one material selected from the group consisting of acrylic acid and methacrylic acid,

2. the weight ratio of acrylonitrile to butadiene in said nitrile rubber ranging from about 15/85 to 50/50,

3. said nitrile rubber having a molecular weight greater than about 10^5, and a Mooney viscosity of from about 40 to 75 ML_8 at 100°C.

4. said nitrile rubber having an initial solubility such that at most about 28 parts by weight thereof are soluble in 100 parts by weight of methyl ethyl ketone at ambient temperatures, and

B. a polyamide resin formed by the condensation polymerization of polymeric fatty acids with an alkylene-polyamine

1. said polymeric fatty acids being polymerized from monocarboxylic aliphatic acids having from 8 through 24 carbon atoms per molecule, and having a molecular weight ranging from about 140 to 400,

2. said alkylene-polyamines being characterized by having the generic formula: $H_2N-(CH_2-CH_2-NH)_n-H$ where n is an integer from 1 through 5,

3. said polyamide resin having an amine value of from about 90 to 350 and by having a molecular weight of from about 500 to 5000,

C. the weight ratio of said polyamide resin to said nitrile rubber in said adhesive composition ranging from about 0.5/100 to 1/1.

3,971,866

THERMOFORMABLE RELEASE LINER

Erlin J. Johnson, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed June 7, 1974, Ser. No. 477,411

Int. Cl.² B32B 1/00, 7/06

U.S. Cl. 428—40 13 Claims

1. A contoured article comprising a drawn thermoformed base sheet, a layer of pressure-sensitive adhesive united to said base sheet, and a release liner temporarily adhered over substantially the whole area of said layer of adhesive, said liner (1) in its unelongated form requiring less than about 3 pounds per inch width tensile load to exhibit a 10 percent elongation at 325°F and greater than about 3 pounds per inch width tensile load to exhibit a 10 percent elongation at 150°F, (2) comprising (a) a thin thermoplastic reinforcing layer of a first material that, in its unelongated form, requires greater than about 1000 pounds per square inch tensile stress to exhibit a 10 percent elongation at 150°F and can be elongated to at least 200 percent of its original length at 325°F and (b) at least one bodying layer united to the reinforcing layer of a second material that can be elongated to at least 200 percent of its original length at 325°F while remaining as a continuous film adhered to the reinforcing layer, and (3) being removable from the adhesive layer as a continuous sheet by hand-pulling.

3,971,867

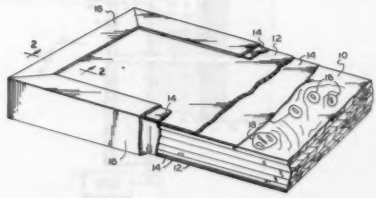
DECORATIVE ACOUSTICAL BUILDING PANEL

Robert L. Randall, 7800 SW. 89th, Portland, Oreg. 97223

Filed July 29, 1974, Ser. No. 492,703

Int. Cl.² B32B 1/04; E04B 1/82; E04C 2/38; G10K 11/04

U.S. Cl. 428—45 6 Claims



1. A decorative acoustical building panel comprising:

a. a core member of ligno-cellulosic board material;

b. a layer of sound-absorbent textile material overlaying substantially the two major surfaces of said core member and adhesively affixed thereto; and

c. a peripheral frame formed of U-shaped channel members extending substantially completely around the perimeter

of said textile-overlaid core member, covering the exposed edges thereof and secured thereto substantially only by adhesive bonding.

3,971,868

FABRIC TAPE FOR SLIDE FASTENER STRINGERS WITH MEANS TO PREVENT UNRAVELING AT ITS SEVERED ENDS

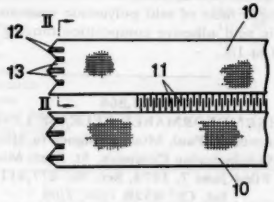
Ryukichi Murai, Toyama, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Feb. 4, 1975, Ser. No. 546,877

Claims priority, application Japan, Feb. 7, 1974, 49-15867[U]

Int. Cl.[2] A47H *1/00;* A44B *19/24*

U.S. Cl. 428—194 2 Claims



1. In a slide fastener stringer tape which is made of a fabric at least partly including synthetic fibers and which has at least one end formed by severance of the stringer tape from a continuous length of such tape, the improvement comprising a plurality of separated thermally fused regions formed at the severed end portion of said stringer tape to prevent the unraveling of the fabric, said thermally fused regions being spaced apart from each other in the transverse direction of said stringer tape, in each thermally fused region, the synthetic fibers therewithin being fused to bond the fabric together.

3,971,869

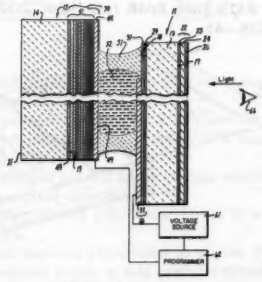
LIQUID CRYSTAL DISPLAY DEVICE AND METHOD

Robert M. Gelber, Healdsburg, and Edward A. Small, Jr., Santa Rosa, both of Calif., assignors to Optical Coating Laboratory, Inc., Santa Rosa, Calif.

Continuation of Ser. No. 338,178, March 5, 1973, abandoned, which is a division of Ser. No. 171,572, Aug. 13, 1971, Pat. No. 3,736,047. This application Dec. 18, 1974, Ser. No. 533,893

Int. Cl.[2] B32B *3/00*

U.S. Cl. 422—195 16 Claims



1. In a member for use with a liquid crystal display device, an insulative substrate having first and second surfaces, a plurality of layers of a dielectric material disposed on one of said surfaces, a layer of conductive material disposed on said dielectric layers, said conductive layer having a pattern therein formed by the absence of conducting material, said dielectric layers and said conducting layer being formed so that in the visual region of 400 to 700 nanometers, the dielectric layers in combination and the conducting layer have substantially the same reflectance and being virtually identical in appearance whereby the pattern is substantially invisible to the naked eye when the liquid crystal display device is not activated.

3,971,870

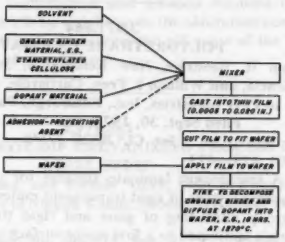
SEMICONDUCTOR DEVICE MATERIAL

Ralph W. Christensen, Butler, Pa.; Everett C. Smith, Sarver, Pa., and George Tibol, Fairview, N.J., assignors to Semi-Elemento, Inc., Solitron Devices, Inc., Santa Clara, Calif., a part interest to each

Continuation of Ser. No. 166,592, July 27, 1971, which is a division of Ser. No. 801,667, Feb. 24, 1969, Pat. No. 3,630,793. This application Jan. 24, 1974, Ser. No. 436,337

Int. Cl.[2] C08L *1/26;* B32B *15/18*

U.S. Cl. 428—336 2 Claims


SOLVENT
ORGANIC BINDER MATERIAL, E.G., CYANOETHYLATED CELLULOSE
DOPANT MATERIAL
ADHESION-PREVENTING AGENT
WAFER
MIXER
CAST INTO THIN FILM (0.0005 TO 0.002 IN.)
CUT FILM TO FIT WAFER
APPLY FILM TO WAFER
FIRE TO DECOMPOSE ORGANIC BINDER AND DIFFUSE DOPANT INTO WAFER, E.G., 10 MIN. AT 1270°C.

1. A self-supporting flexible film having a thickness of about 0.0005 to 0.02 inches consisting essentially of from 90 to 97% of a dopant component consisting essentially of a finely divided semiconductor dopant material selected from the group consisting of phosphorous pentoxide, arsenic, antimony, iron, cobalt, boron nitride, boric acid, indium, methyl borate and gallium, said dopant component homogeneously admixed with from 3 to 10% of a volatile organic binder selected from the group consisting of cyanoethylated cellulose, methyl cellulose, polyvinyl alcohol, starch and vinyl butyral.

3,971,871

TEXTURIZING SIZE AND GLASS FIBERS COATED WITH SAME

Harold L. Haynes, Granville, and Michael J. Harvey, Newark, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 408,229, Oct. 19, 1973, abandoned. This application Apr. 30, 1975, Ser. No. 572,974

Int. Cl.[2] C08L *3/08, 3/06*

U.S. Cl. 428—392 10 Claims

1. Glass fibers having a coating consisting essentially of the following solids in approximate parts by weight: 1.25 to 3.00 of a starch having a degree of substitution of from approximately 0.01% to 0.1% of an ether or ester radical of a tertiary amine and that is generally devoid of primary amines, 0.2 to 0.8 of a nonionic lubricant, 0.04 to 0.16 of a nonionic lubricant emulsifier, 0.1 to 0.6 of Bis-beta-3-(2-heptadecylimidazolyl) ethyl amine, and 0 to 1.0 of a humectant.

3,971,872

PROCESS FOR THE PRODUCTION OF AN ABRASION RESISTANT OPTICAL ELEMENT

Albert R. LeBoeuf, Sturbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Sept. 30, 1974, Ser. No. 510,348
Int. Cl.² B05D 5/06
U.S. Cl. 428—412 10 Claims

1. An allyl diglycol carbonate lens having a transparent abrasion resistant coating upon at least one surface obtained by (1) hydrolyzing said surface of said lens in an aqueous alkaline solution; (2) coating said lens with an aqueous coating composition comprising a mixture of an acid polysilicic ester of an alcohol containing from 1 to 12 carbon atoms and having up to four silicic acid ester groups per silicon atom, and a polyvinyl alcohol comprising 90% to 100% hydrolyzed polyvinyl acetate; and (3) drying and curing said coating at an elevated temperature.

3,971,873

METHOD OF PRODUCING HIGH BRIGHTNESS CORROSION RESISTANT FINISH ON THE SURFACE OF ALUMINUM AND ITS ALLOYS

Herbert K. Price, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Apr. 23, 1974, Ser. No. 463,341
Int. Cl.² B32B 15/08, 27/30
U.S. Cl. 428—463 11 Claims

1. An article composed of aluminum or an aluminum base alloy having a recrystallized metallurgical structure, and having adhered directly on the metal surface thereof a transparent thermoplastic solvent-soluble resinous coating composition consisting essentially of (*a*) between about 10% and about 40% by weight of a terpolymer of vinyl chloride, vinyl acetate and maleic acid and (*b*) between about 60% and about 90% by weight of a lower alkyl methacrylate ester polymer, said coated article exhibiting a spectral reflectance of at least 95%.

3,971,874

OPTICAL INFORMATION STORAGE MATERIAL AND METHOD OF MAKING IT

Takeo Ohta, Nara, and Mutsuo Takenaga, Katano, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Aug. 26, 1974, Ser. No. 500,468
Claims priority, application Japan, Aug. 29, 1973, 48-97615; Aug. 29, 1973, 48-97616; Aug. 29, 1973, 48-97617
Int. Cl.² C23C 3/04; G01D 15/34
U.S. Cl. 428—432 11 Claims

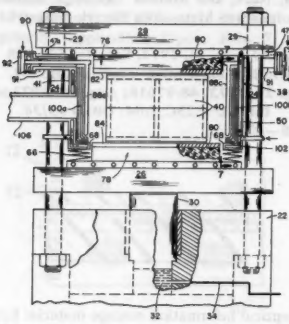
1. In an optical information storage material having a base and a film deposited on said base the state of which can be changed between the low optical density state and the high optical density state by the application of electrical, optical or thermal energy, the improvement wherein said film comprises TeO_{x1} in which $0 < x1 < 2.0$.

3,971,875

APPARATUS AND METHOD FOR VACUUM HOT PRESS JOINING, COMPACTING AND TREATING OF MATERIALS

John A. Regalbuto, Fort Worth, Tex., assignor to General Dynamics Corporation, Fort Worth, Tex.

Filed Jan. 4, 1974, Ser. No. 430,857
Int. Cl.² H05B 3/66
U.S. Cl. 13—31 19 Claims



1. A simplified essentially gastight furnace chamber device for convenient repetitive reuse in an open bed type press, providing for work materials to be easily placed into and removed from the chamber and heated within a chemical reaction inhibiting environment such as a high degree of vacuum or inert gas while subjected to pressure from the press acting externally against a collapsible wall section of the chamber comprising:

a. an essentially gastight, reusable furnace chamber formed as a unitary enclosure adapted to be operatively positioned between opposing press platens of an open bed type press that provides for application of mechanical pressure to objects located between the press platens, said chamber having a continuous external boundary wall including rigid top and bottom wall portions and a side wall portion integrally connecting said top and bottom wall portions, said chamber being dimensionally contractible and expansible in use;

b. the interior of said chamber having a work receiving area adapted to receive and hold work materials therein to be formed, compacted, joined or treated;

c. a relatively large access opening substantially the full height and width of said work receiving area opening through said chamber side wall and communicating the exterior of said chamber with the interior of said work receiving area for easy passage through said boundary wall of work materials to be placed into or removed from said work receiving area;

d. access door means at said chamber boundary wall operative for opening and closing said access opening to provide substantially gastight sealing of the chamber interior about the work materials placed therein when secured closed and for inserting into and removing of work materials from the chamber interior when open;

e. means for securing said access door sealed over said opening and for releasing the door when it is to be opened;

f. means operatively connected with said chamber interior for providing a chemical reaction inhibiting environment thereto;

g. heating means positioned in said chamber operative when activated to supply heat to work materials placed therein; and

h. expandable and contractable means positioned in said side wall portion to form said chamber external boundary wall to have a dimensionally stable section and a collapsible dimensionally non-stable boundary wall section each containing one of said rigid top and bottom wall portions, the non-stable section providing for repetitively increasing and decreasing the height of said chamber by expansion and contraction such that the press platens can be engaged externally directly against said rigid top and bottom wall portions of the chamber to apply pressure therethrough to the work materials therein; and said non-stable wall section being operatively repetitively recoverable to its original operatively expanded dimensions after being dimensionally contracted in use to provide for contracting and expanding the volume of the work receiving area in the applying and releasing of the external pressures to or from the work materials within;

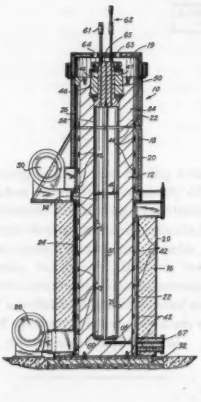
i. whereby mechanical force may be applied to work materials within said chamber interior in a substantially even distribution of pressure across said materials by means of pressing forces applied against one of said wall sections when one of the press platens is moved against the exterior of said chamber.

3,971,876

TEMPERATURE CONTROL APPARATUS

Donald E. Witkin, and Arnold G. Bowles, both of Warren, Pa., assignors to National Forge Company, Irvine, Pa.

Division of Ser. No. 536,372, Dec. 26, 1974, Pat. No. 3,922,527. This application July 3, 1975, Ser. No. 592,888
Int. Cl.² H05B 1/02
U.S. Cl. 13—31 11 Claims



1. Apparatus for controlling the temperature distribution in a pressure vessel having a large thermal time lag comprising,

an enclosed, high strength walled chamber, the chamber being divided into an upper and a lower portion by a baffle,

a first and a second heating element associated with the upper portion,

a third heating element associated with the lower portion,

a first temperature sensing means for providing an output indicative of temperature in the upper portion,

a second temperature sensing means for providing an output indicative of temperature in the lower portion,

a first temperature controller for providing an output signal responsive to the output of the first temperature sensing means,

a differential temperature controller for providing an output signal responsive to a difference in outputs of the first and second temperature sensing means,

a first driver responsive to the output signal of the first temperature controller for applying energy to the first heating element,

a driver means responsive to the output signal of the differential temperature controller for applying energy respectively to the second and third heating elements, and

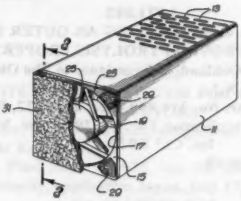
the total energy applied to said second and third heater elements by said driver means being substantially independent of the value of the output signal from the differential temperature controller.

3,971,877

REMOVABLE FILTERS ON ELECTRONIC CHASSIS AND METHOD OF ASSEMBLING SAME

Lawrence Y. Lee, Santa Ana, Calif., assignor to Lawrence Y. Lee, Santa Ana, Calif.

Filed Sept. 29, 1975, Ser. No. 617,919
Int. Cl.² H01B 7/34, 9/06; H01G 3/03, 5/10
U.S. Cl. 174—16 R **11 Claims**



6. Apparatus for attaching an air permeable, open cell filter element having an interconnected lattice structure over the air inlet passage of a fan-forced convection cooling electronic chassis, comprising:

a flat sheet member attached to said electronic chassis adjacent said air inlet passage; and

plural semiresilient hook members protruding from said flat sheet member on the side opposite said chassis, said hook members positioned within the interstices of said open cell filter element and engaging said lattice structure.

10. A method of attaching an open cell filter element to the air inlet opening of a forced convection cooled electronic chassis, comprising:

attaching a fastener having plural protruding hook members to said electronic chassis adjacent said air inlet opening;

placing said open cell filter element over said air inlet opening in direct contact with said fastener; and

applying pressure to said filter element to directly interengage said open cells and said plural hook members.

3,971,878

VLF ANTENNA TOWER BASE INSULATOR

Kwang Ta Huang, Port Hueneme, and James L. Brooks, Oxnard, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 3, 1975, Ser. No. 619,556
Int. Cl.² H01B 17/34
U.S. Cl. 174—30 **10 Claims**

1. A VLF antenna base insulator comprising:

a. a metal base member having a raised central portion forming a first chamber, and a flanged rim about the bottom edge thereof;

b. a plate means adjacent the bottom of said base member for sealingly enclosing said first chamber;

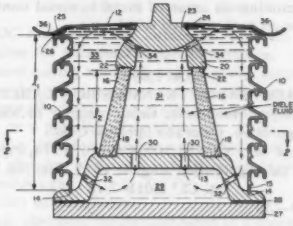
c. a hollow central core member of insulating material for providing high mechanical support strength, said central core member being seated on top of the raised central portion of said base member; said base member thus enclosing the bottom of said hollow central core member;

d. a cap member enclosing the top of said hollow central core member, thus enclosing a second chamber formed by the inner wall of said hollow core member, said base member and said cap member;

e. a cylindrical housing of surface insulating material comprising a plurality of sheds and petticoats which form the outer insulator wall of the VLF antenna base insulator; the outer surface distance along the longitudinal axis of said cylindrical housing being very long as compared to the axial length thereof;

f. the bottom edge of said cylindrical housing being sealed against the flanged rim of said base member;

g. a metal cover sealingly engaging the top of said cap member and the upper edge of said cylindrical housing,



thus enclosing a third chamber formed by the inner wall of said cylindrical housing, the outer wall of said hollow central core member, said base member, said cap member and said cover;

h. mechanical bearing forces and stresses exerted axially on said VLF antenna base insulator assembly being borne by said base member, central hollow core member and cap member, without any such mechanical forces being transmitted to said cylindrical housing;

i. at least one passageway between each of said first and second chambers, said first and third chambers, and said second and third chambers;

j. said first, second and third chambers and said passageways being filled with a dielectric fluid, said dielectric fluid which also acts as a coolant being circulated through said first, second and third chambers via said passageways due to the natural density differences in the fluid as caused by heat generated thereabout by normal a.c. electrical fields formed while the VLF antenna is in use.

3,971,879

HIGH FREQUENCY CABLE WITH BRIDGING STRIP

Lee J. Rosenberg, Deerfield, and E. Mark Wolf, Sycamore, both of Ill., assignors to The Anaconda Company, New York, N.Y.

Filed Jan. 31, 1972, Ser. No. 222,205
Int. Cl.² H01B 11/06
U.S. Cl. 174—36 **3 Claims**

1. A television-frequency communication cable comprising:

A. an elongated metallic conductor,

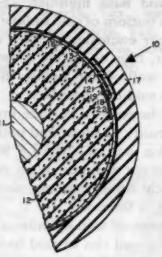
B. a wall of expanded polyolefinic insulation surrounding said conductor,

C. a metal tape surrounding said wall, said tape comprising a longitudinal overlapped seam,

D. a solid, abrasion-resistant synthetic-resinous jacket surrounding said tape,

E. a layer of adhesive bonding the outer surface of said tape to said jacket and bonding said tape to itself at said seam, said adhesive comprising a fine longitudinal hiatus between the metallic portions of said tape,

F. a longitudinal strip of metal under said seam, said strip being compressed against said tape by said insulation,



being free from bonding to said tape, and said strip comprising continuous areas of metal-to-metal contact with said tape on both sides of said hiatus.

3,971,880

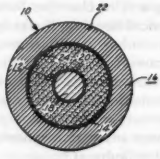
PHASE STABLE TRANSMISSION CABLE

Dewey F. Harris, Monument, Colo., assignor to Kaman Sciences Corporation, Colorado Springs, Colo.

Division of Ser. No. 515,307, Oct. 16, 1974, Pat. No. 3,909,555. This application Aug. 4, 1975, Ser. No. 601,511

Int. Cl.² H01B 7/18

U.S. Cl. 174—36 **1 Claim**



1. A high temperature electrical length stable radio frequency cable comprising a center conductor, a spaced concentric conductive sheath and a dielectric insulating medium between said sheath and the center conductor wherein the sheath comprises a hollow tubular member of a metal or metal alloy of low coefficient of thermal expansion with a relatively thin layer of low electrical resistivity metal bonded to the inside thereof and wherein the dielectric material is selected from the group consisting of silica, magnesia and alumina.

3,971,881

DAMPING SPACER FOR THREE CONDUCTOR BUNDLE

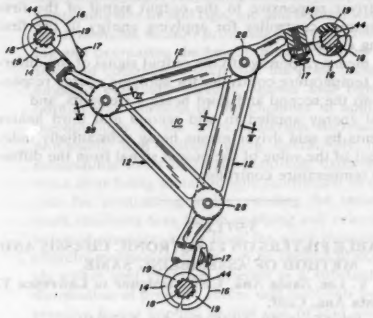
Ronald G. Hawkins, Massena, N.Y., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Oct. 29, 1975, Ser. No. 626,975

Int. Cl.² H02G 7/14, 7/12

U.S. Cl. 174—42 **15 Claims**

1. A frameless damping spacer for spacing three parallel, overhead conductors, the damping spacer comprising three, rigid, spacer arms and conductor clamping members, said clamping members being respectively located at one end of each of the spacer arms, an integral housing provided at the other end of each spacer arm, an opening provided in each arm near the clamping member, and an opening extending through said housing, said spacer arms being disposed to align the opening near the clamping member of one arm with the opening provided in the housing of another arm to form a triangular shape spacing structure, with a pair of spacer arms being disposed together at each corner of the structure, such that one spacer arm is located adjacent one end of the housing of another spacer arm, a rigid pin extending through the opening in the one arm near its clamping member and through the



opening in the housing of the other arm disposed in alignment therewith, and, a close coil, vibration damping means located around the pin and in the opening of the housing.

3,971,882

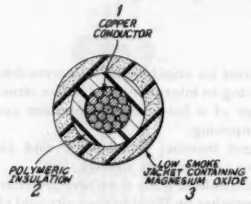
ELECTRICAL CABLE HAVING AN OUTER SHEATH WITH IMPROVED PYROLYSIS PROPERTIES

Dominic A. Alia, Oakland, N.J., assignor to The Okonite Company, Ramsey, N.J.

Division of Ser. No. 316,848, Dec. 20, 1972, Pat. No. 3,821,139. This application Feb. 14, 1974, Ser. No. 442,333

Int. Cl.² H01B 7/02

U.S. Cl. 174—110 SR **2 Claims**



2. In combination in an electrical cable, at least one conductor, an essentially smokeless insulating jacket enclosing said conductor, said jacket consisting essentially of chloro-sulfonated polyethylene and chlorinated polyethylene having uniformly dispersed therethrough at least about 2.5% by weight of magnesium oxide effective to impart an intumescence property to said composition when subjected to elevated temperatures.

3,971,883

SILICONE RUBBER-ETHYLENE VINYL ACETATE ADHESIVE LAMINATES AND PREPARATION THEREOF

Lawrence A. Meeks, Cincinnati, and James W. Biggs, Lebanon, both of Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Sept. 12, 1975, Ser. No. 612,595

Int. Cl.³ H01B 7/00; C09J 5/02; B32B 13/12

U.S. Cl. 174—120 SR **19 Claims**

13. An insulated ignition wire comprising a central conductor, a first insulating material surrounding the central conductor and a second insulating material surrounding the first insulating material and bonded thereto, wherein said first insulating material is crosslinked ethylene-vinyl acetate and said second insulating material is crosslinked silicone rubber and wherein the interfacial surfaces of said first and second insulating material are bonded by a powder bonding agent in an amount of 0.00001–0.001 gram per square inch of surface,

said bonding agent being silica or a mixture of silica and a member of the group consisting of a silane and polyfunctional monomer.

3,971,884

ETHYLENE-VINYL ACETATE SILICONE RUBBER ADHERENT LAMINATES AND METHOD OF PRODUCTION

Lawrence A. Meeks, Cincinnati, and James W. Biggs, Lebanon, both of Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Sept. 12, 1975, Ser. No. 612,596
Int. Cl.² H01B 7/00; C09J 5/02; B32B 13/12
U.S. Cl. 174—120 SR **12 Claims**

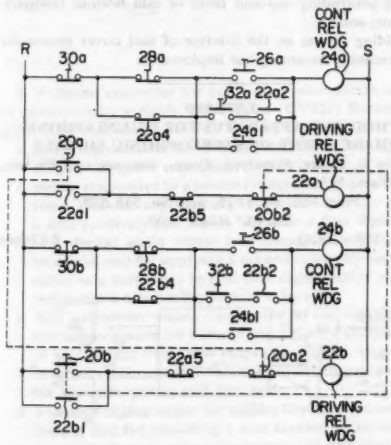
9. An insulated ignition wire comprising a central conductor, a first insulating material surrounding the central conductor and a second insulating material surrounding the first insulated material and bonded thereto by a surface bonding agent, wherein said first insulating material is a crosslinked ethylene-vinyl acetate copolymer, said second insulating material is crosslinked silicone rubber, and said bonding agent is selected from the group consisting of silane and polyfunctional monomers.

3,971,885

REMOTE CONTROL SYSTEM FOR PASSENGER CONVEYORS

Katsumi Kito, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed July 17, 1975, Ser. No. 596,609
Claims priority, application Japan, July 17, 1974, 49-82512
Int. Cl.² H04N 7/18
U.S. Cl. 178—6.8 **6 Claims**



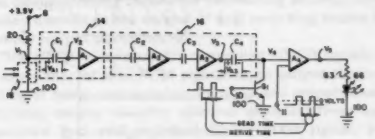
1. A control system for remotely controlling the operation of a plurality of passenger conveyors, comprising one monitor switch for each of the passenger conveyors, television receiver means responsive to the operation of each of said monitor switches to remotely monitor the operation of that passenger conveyor operatively associated with the operated monitor switch, remotely operated switch means operative to remotely control the operation of the respective passenger conveyors, and means for remotely controlling the operation of each of the passenger conveyors only when the latter is monitored by said television receiver means.

3,971,886

METHOD OF CONTROLLING A REFERENCE TEMPERATURE TO RESTORE DC LEVEL FOR A THERMAL IMAGING SYSTEM

Sen-Te Chow, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 1, 1975, Ser. No. 564,179
Int. Cl.² H04N 5/14
U.S. Cl. 178—7.1 **7 Claims**



1. A DC restoration and automatic reference temperature level system for a thermal imager comprising:
- a scanner having an oscillating reflecting mirror;
- an afocal lens system for receiving radiation from a target image reflected from said mirror and sweeping said radiation on a plurality of detectors;
- a plurality of video channels connected at the output from said plurality of detectors for transmitting video signals therethrough;
- a plurality of integrators;
- a voltage clamping means connected to a common terminal of said plurality of video channels, said common terminal is clamped to ground periodically at a point where there is a long time constant during the unclamped time and a short time constant during the clamped time to provide a DC voltage restoration and wherein said common terminal comprises an input to a plurality of light-emitting-diode circuits and a first input to said plurality of integrators;
- a positive voltage bias connected as a second input to said plurality of integrators;
- a comparator circuit for comparing the outputs from said plurality of integrators and for selecting the largest average voltage over the integrated active period when the plurality of video channels are unclamped;
- a video signal amplifier for amplifying said largest average voltage;
- a thermo-electric cooler controlled by the output from said video signal amplifier; and
- an IR window having a reference temperature strip thereon positioned at the focal plane of said afocal lens and having an input to said reference temperature strip from said thermo-electric cooler for establishing a reference temperature on said strip during dead time of said imager that is commensurate with said target temperature during the active time of said imager to prevent suppressive streaking of a cold target image by a hot target image.

3,971,887

DYNAMIC MAGNETIC BUBBLE DISPLAY SYSTEM

Burn Jeng Lin, Shrub Oak, and Yeong Show Lin, Mount Kisco, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

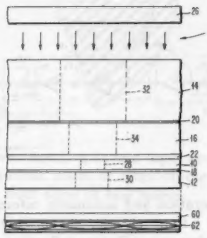
Filed May 9, 1975, Ser. No. 575,908
Int. Cl.² H04N 5/66
U.S. Cl. 178—7.3 D **18 Claims**

1. An optical processing and display device for producing multi-tone display patterns comprising
- a plurality of separate magnetic bubble array layers arranged in a stack, said magnetic bubble array layers being each of a different thickness, each of said magnetic bubble array layers being composed of material that supports

magnetic bubble domains which are movable in predetermined paths in said array,

electrical signal means connected to each of said magnetic bubble array layers for selectively propagating magnetic bubble domains through said predetermined paths of said layers,

said magnetic bubble domains selectively propagated through said paths of said layers having dimensions proportional to and determined by the thickness of the layers



in which they are propagated such that the bubble domains in the separate layers of bubble arrays in said stack are of different predetermined sizes,

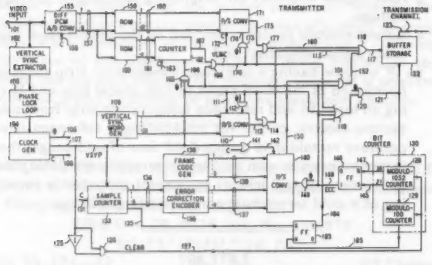
and means for directing light through said stack of bubble array layers, the intensity of transmission of the light directed through said stack of bubble array layers being varied a different amount by each layer of the bubble domains in each layer in accordance with the thickness of each layer.

3,971,888

SYNCHRONIZATION SYSTEM FOR VARIABLE LENGTH ENCODED SIGNALS

Yau Chau Ching, Morganville, and Ming-Chwan Chow, Holmdel, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 2, 1975, Ser. No. 564,285
Int. Cl.² H04N 5/04
U.S. Cl. 178—69.5 TV **20 Claims**



1. A synchronization system for use in the transmission of a data stream of variable bit length code words comprising

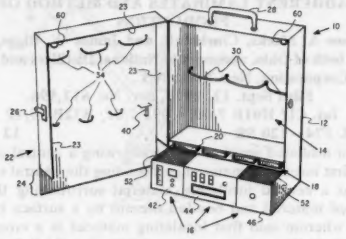
first counting means for cumulatively counting said code words, second counting means operative concurrently with said first counting means for cyclically counting the cumulative number of bits in said data stream, encoding means operative when said second counting means reaches a predetermined count for generating a synchronization word by encoding the current count of said first counting means, and means for inserting said synchronization word into said data stream so that the inserted synchronization word indicates a selected code word in said data stream.

3,971,889

PORTABLE BAR ADAPTED FOR MOUNTING ELECTRONIC EQUIPMENT

Robert A. Hays, 717 SW. 6th, Apt. 18, Newport, Oreg. 97365

Filed Apr. 22, 1974, Ser. No. 462,613
Int. Cl.² H04R 27/00
U.S. Cl. 179—1 AT **7 Claims**



1. A portable bar adapted for mounting electronic equipment comprising:

a. a normally upright case including an upper compartment having means for holding a plurality of beverage bottles in upright positions and a bottom compartment disposed in fixed relation to said upper compartment to extend beneath said upper compartment and protrude perpendicularly forwardly therefrom so as to form a generally L-shaped case, said bottom compartment defining a space beneath said upper compartment, and having a protruding top and front, and being adapted to house said electronic equipment partially beneath said upper compartment to minimize the depth of said case;

b. openable cover means attached to the front of said case for simultaneously covering said upper compartment and said protruding top and front of said bottom compartment; and

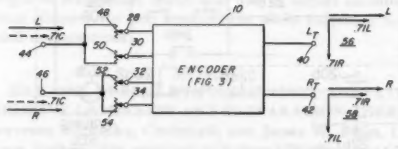
c. holding means on the interior of said cover means for detachably mounting bar implements.

3,971,890

METHOD AND APPARATUS FOR QUADRAPHONIC ENHANCEMENT OF STEREOPHONIC SIGNALS

Benjamin B. Bauer, Stamford, Conn., assignor to CBS Inc., New York, N.Y.

Filed Feb. 10, 1975, Ser. No. 548,329
Int. Cl.² H04R 5/00
U.S. Cl. 179—1 GQ **8 Claims**



1. The method of processing first and second stereophonically related signals respectively containing left (L) and center (C) components and right (R) and center (C) components wherein the C signal components to the extent they are present are common and in phase with their respective L and R components, to produce two signals which when reproduced by a four-channel decoder and loudspeaker system produce a sound field simulative of that produced from a quadraphonically-encoded record, said method comprising the steps of:

transferring at least a first predetermined reduced amplitude proportion of said first and second signals to first and second output channels, respectively, without relative phase shift between them,

transferring said first predetermined reduced amplitude proportion of said first signal to said second output channel with a phase shift of about 90° lagging relative to the first signal in said first output channel, and

transferring said first predetermined reduced amplitude proportion of said second signal to said first output channel with a phase shift of about 90° lagging relative to the first signal in said first output channel.

3,971,891

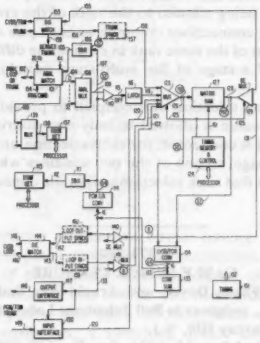
ADAPTABLE TIME DIVISION SWITCH

John R. Wolcott, Orlando, Fla., assignor to Martin Marietta Corporation, Rockville, Md.

Filed Mar. 14, 1975, Ser. No. 558,605

Int. Cl.² H03K *13/22;* **H04J** *3/00;* **H04L** *3/00;* **G06F** *5/00*

U.S. Cl. 179—15 AP **32 Claims**



1. A digital converter for converting information arranged in continuously variable slope delta (CVSD) format into a pulse code modulated (PCM) format, comprising:

a. a first digital adder for adding first and second inputs and for providing the sum thereof as an output,

b. means responsive to a predetermined number of consecutive CVSD bits representing said information for applying a first relatively low binary value as a first input to said first digital adder when said consecutive bits are not identical, and for applying a second relatively high binary value as a first input to said first digital adder when said consecutive bits have identical values,

c. first subtractor means responsive to the output of said first adder means for subtracting a binary shifted version of said output from said output, unshifted, to provide a difference value, said difference value being connected as the second input to said first adder,

d. a second digital adder for adding first and second inputs thereto and for providing a sum thereof as an output,

e. true/complement means responsive to the output from said first adder and the last of said consecutive CVSD bits for applying said output in true form to the first input of said second adder when said last CVSD bit is a first value, and for applying the complement of said output to the first input of said second adder when said last CVSD bit is a second value, opposite said first value,

f. second subtractor means responsive to the output of said second digital adder means for subtracting a binary shifted version of the output of said second adder from an unshifted version of the output of said second adder to provide a difference value, said difference value being connected as the second input to said second adder,

g. wherein the said output from said second digital adder is in PCM format and represents said information.

8. A telephone switching network comprising:

a. first multiplexing means adapted to receive a multiplicity of CVSD and CVSD/TDM inputs and provide a CVSD/TDM output; said output representing signals before switching,

b. switching means connected to receive said CVSD/TDM signals from said multiplexer means and selectively rearrange the data in the channels of said CVSD/TDM signals, the output therefrom representing said signals after switching,

c. first demultiplexing means for connecting selected ones of the channels in the output of said switching means to selected output ports thereof,

d. a CVSD/PCM converter for converting CVSD signals at an input thereof into PCM signals at an output thereof, said input being connected to the input and output of said switching means whereby selected channels from said unswithed and said switched CVSD/TDM signals are routed to said converter, and

e. means for connecting said switching means to an analog loop to enable said switching network to switch analog signals, said means comprising:

i. a differential amplifier having one input connected to receive input analog signals, and a second input, the output therefrom being connected as a CVSD signal to said first multiplexing means,

ii. a PCM to analog converter having an input connected to the output of said CVSD/PCM converter and an output connected to said second input of said differential amplifier.

3,971,892

TIMING APPARATUS FOR PCM/TDM SWITCHING NETWORKS

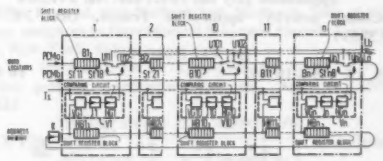
Max Schlichte, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Apr. 21, 1975, Ser. No. 569,660

Claims priority, application Germany, Apr. 22, 1974, 2419251

Int. Cl.² H04Q *11/00*

U.S. Cl. 179—15 BA **2 Claims**



1. Timing apparatus for pulse code modulation, time division multiplex (PCM/TDM) switching networks in a TDM telecommunication system wherein for each call the same time slot is used on incoming and outgoing PCM/TDM trunks, said timing apparatus including a number of word-organized storage locations equal to the number of PCM words per sampling pulse frame and an equal number of address memory locations, individually assigned to word-organized storage locations, for storing the addresses of the time slots during which PCM information words stored temporarily in word-organized storage locations will be retransmitted, the timing apparatus comprising:

first shift register means comprising a number of series-connected blocks of bistable stages, said blocks, respectively, forming said word-organized storage locations,

means connecting an input of the first in the series sequence of said first shift register blocks to incoming conductors of a PCM/TDM trunk and means connecting an output of

the last in the series sequence of said first shift register blocks to outgoing conductors of the PCM/TDM trunk,

a pair of simultaneously actuated switches interposed between each succeeding pair of blocks of said first shift register means, each of said switches having a control input, the output of a block being connected to an input of the next succeeding block when the switches constituting the pair interposed therebetween are in their non-operating positions,

service trunk means having incoming and outgoing conductors one of said switches in each said pair, when in its operating position, connecting an output of a said block of said first shift register means to an outgoing conductor of said service trunk means, the other of said switches of the pair, when in its operating position, connecting an input of the next succeeding block of said first shift register means to an incoming conductor of said service trunk means,

second shift register means comprising a number of blocks of bistable stages formed into a series-connected ring for registering a time slot address,

a number of bit comparator means, an input of each said block of said second shift register means being connected to an input of a said bit comparator means associated therewith,

timing circuit means, common to the address memory locations, carrying a time position code corresponding to the time slot being processed, other inputs of said bit comparator means being connected to said timing circuit means,

each said bit comparator means including means for actuating the said control inputs of a said pair of switches coupled thereto when said time position code equals the said time slot address registered in the said block of said shift register means coupled to that bit comparator means, thereby indicating a word-organized storage location and connecting same to said service trunk means.

3,971,893

CONTROL SYSTEM AND PROCESS FOR A SPACE-DIVISION SWITCHING NETWORK

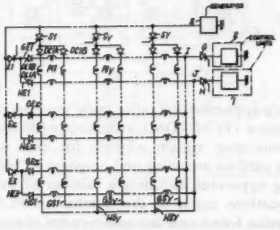
Christian Yves Tournier, and Jean Bernard Kerihuel, both of Paris, France, assignors to International Standard Electric Corporation, New York, N.Y.

Continuation of Ser. No. 408,598, Oct. 23, 1973. This application July 28, 1975, Ser. No. 599,354

Claims priority, application France, Oct. 31, 1972, 72.38597

Int. Cl.[2] H04Q 9/00

U.S. Cl. 179—18 GE **10 Claims**



1. A control system for a space-division multistage switching network, the network including a plurality of crosspoints arrayed in matrix planes in which each crosspoint has a rank in a particular row, i.e., a row rank and a rank in a particular column, i.e., a column rank, each crosspoint including four switching coils belonging to different categories, the coils being so arranged that coils of the same category of the various crosspoints in a row or a column of a matrix plane are connected to complete a row winding or a column winding having a row rank and a column rank, crosspoint switching being controlled by means of four pulses in the form of two pairs of pulses, pulses of a pair having the same value and the four pulses being applied to control the coils of the concerned crosspoint over the respective row winding and column winding, the said control system comprising:

a plurality of winding selection units to select each winding when that winding is to be energized during crosspoint switching, means coupling two of said winding selection units respectively to different ends of the selected winding, one of said selection units being coupled to select a winding according to either the row rank or the column rank common to crosspoints whose coils form the concerned winding and the other one of said selection units being coupled to provide a switching pulse of selected value to the selected winding,

each winding selection unit coupled to select a winding according to either a row rank or a column rank including a connection common to two windings respectively, including coils of different categories which are respectively located at a crosspoint in a matrix plane, those two windings being allotted to the rank of the crosspoint and including connections common to each pair of coils for a crosspoint of the same rank in each of the different matrix planes of a stage of the multi-stage switching network, and

each winding selection unit coupled to provide a pulse of selected value is allotted to only one matrix plane in a stage and is connected, for each selection unit associated to that stage, to one of the two windings which are connected to that rank selection unit in the concerned matrix plane.

3,971,894

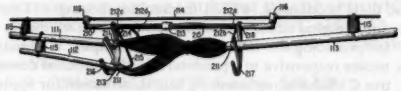
CABLE SPLICE CLOSURE

Carl Walter Faust, Dover, and Arnold Ray Smith, Chester, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 15, 1976, Ser. No. 649,489

Int. Cl.[2] H02G 7/06, 15/10

U.S. Cl. 174—41 **7 Claims**



1. Apparatus for enclosing cable splice connections between multiple conductors in at least one cable having an electrical ground sheath and supported by a messenger cable and corresponding mulitple conductors in at least one other cable having an electrical ground sheath and supported by said messenger cable, said apparatus including

a unitary support member,

means for attaching said support member to said messenger cable, said attaching means also for providing an electrical connection between said support member and said messenger cable,

means, affixed to said support member, for providing a flexible electrical connection between said ground sheaths in said one and said other cable and said support member,

unitary flexible means for enclosing said splice connections, said flexible means having an inner surface and first and second parallel edges, a portion of said inner surface supported atop said support member such that said first and second parallel edges are juxtaposed to one another, and

means for securing said juxtaposed first and second parallel edges to one another.

3,971,895

TELEPHONE CONFERENCE ARRANGEMENT

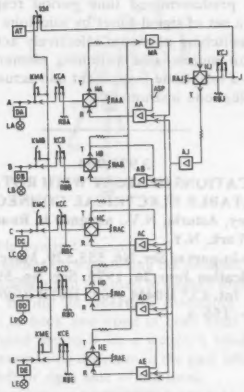
John Edward Hollis, High Wycombe; and John Albert Barrett, Holyport, both of England, assignors to Plessey Handel und Investments AG, Zug, Switzerland

Filed Apr. 3, 1975, Ser. No. 564,814

Claims priority, application Great Britain, Apr. 5, 1974, 15539

Int. Cl.² H04M 3/56

U.S. Cl. 179—1 CN 5 Claims



1. A telephone conference circuit having a plurality of 2-wire access-paths available for connection to individual telephones of participants of a conference situation, characterized in that it has similar circuit-section for each of said access-paths, and each circuit-section comprises (a) a hybrid transformer, a switching device and a balancing means and having said hybrid transformer substantially balanced by said balancing means in a first state of said switching device and by the access path, when occupied, in a second state of the switching device, and (b) a buffer amplifier connected in the receive channel of the 4-wire side of the associated hybrid transformer, and in which the transmit channel of the 4-wire side of the hybrid transformers of all said circuit-sections are connected to the input path of a mixing amplifier which during a conference call supplies a composite signal to an input of each said buffer amplifier; each said buffer amplifier having a second input path to which a signal derived from the transmit channel of the associated hybrid transformer is applied.

3,971,896

TWO-TONE GENERATOR USING SWITCHING TRANSISTORS IN LC RESONANT CIRCUITS CONTROLLED BY PUSH-BUTTON

Kouichi Sekiguchi, Asaka, Japan, assignor to Iwasaki Tsushinki Kabushiki Kaisha, Japan

Filed Nov. 13, 1974, Ser. No. 523,497

Claims priority, application Japan, Nov. 16, 1973, 48-128315; Feb. 9, 1974, 49-15855; Feb. 9, 1974, 49-15856

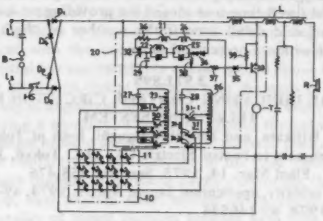
Int. Cl.² H04M 1/50; H03B 5/12

U.S. Cl. 179—84 VF 4 Claims

1. A tone generator, for producing a multifrequency signal in the form of two selectable tone signals, comprising:

a two-tone oscillator having two LC resonance circuits each comprised of a coil and a capacitor;

a plurality of switching transistors having the collector-emitter paths thereof coupled to corresponding ones of said two resonance circuits to switch the values of the inductances of the coils in response to the turning ON of the collector-emitter paths, said switching transistors comprising a first group of NPN transistors having their respective collector-emitter paths each connected in common between the capacitor and respective taps progressively along the coil comprising a first of said resonance circuits, and a second group of PNP transistors having



their respective collector-emitter paths each connected in common between the capacitor and respective taps progressively along the coil comprising the second of said resonance circuits;

a plurality of switches individually controllable and each having a contact connected in series between the bases of a respective pair of transistors one of which is respectively included in the first group and one in the second group; and

current means electrically coupled to said switching transistors for flowing, in the base-emitter paths of respective selected ones of said switching transistors of the two LC resonance circuits, base currents greater than the peak values of respective AC currents developed in the two LC resonance circuits to turn-ON said selected ones of said switching transistors and switch the inductances of said coils thereby to select the tones developed by said oscillator, said selected switching transistors being selected by closure of the contact of a selected one of the switches to electrically connect their bases and complete a flow path for the current supplied by said current means.

3,971,897

CIRCUIT ARRANGEMENT FOR A SELECTIVE SIGNAL RECEIVER, PARTICULARLY FOR USE IN TELEPHONE SYSTEMS

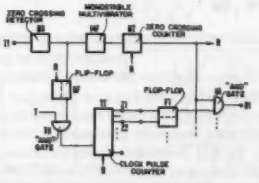
Wolf Ohl, Korntal, and Herbert Ball, Stuttgart, both of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Aug. 15, 1974, Ser. No. 497,708

Claims priority, application Germany, Aug. 16, 1973, 2341223

Int. Cl.² H04M 1/50; H04Q 1/46

U.S. Cl. 179—84 VF 4 Claims



1. A circuit arrangement for a selective signal receiver which, for frequency recognition, counts the zero crossings of an input signal occurring at each signal-frequency half cycle and measures the time distances between the zero crossings, particularly for use in telephone systems, comprising a circuit operable between a normal "off" state and an "on" state, a zero-crossing counter coupled to said circuit, said circuit responding to the occurrence of a zero crossing to change to the "on" state and provide a counting pulse for the zero-crossing counter, said circuit remaining in said "on" state for a

dwell time which is only little shorter than the duration of the signal-frequency half cycle and remaining uninfluenced by additional zero crossings occurring during said dwell time, said circuit which measures the time distance between the zero crossings including means for counting clock pulses during said dwell time and means for providing an output at the end of said dwell time if the number of clock pulses counted is within a prescribed range.

3,971,898

VISUAL INDICATING CONTROL CIRCUIT IN KEY TELEPHONE SYSTEM

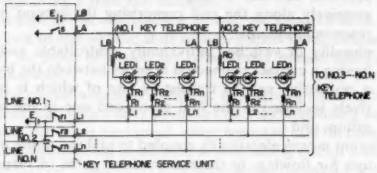
Tokuhisa Hijikata, and Koichi Sekiguchi, both of Tokyo, Japan, assignors to Iwatsu Electric Co., Ltd., Tokyo, Japan

Filed Mar. 14, 1975, Ser. No. 558,476

Claims priority, application Japan, Apr. 9, 1974, 49-40335; Dec. 19, 1974, 49-146544

Int. Cl.² H04M *1/22*

U.S. Cl. 179—99 **8 Claims**



1. A visual indicator control circuit for use in key telephone systems including a plurality of lines comprising:

a direct current power supply,

a plurality of light emitting diodes provided in a key telephone set coupled in series across said power supply,

a plurality of transistors provided in the key telephone set having collector-emitter paths connected in parallel with said light emitting diodes,

control circuit means provided in a key service unit coupled to the base electrodes of said transistors for selectively switching said transistors corresponding to the use status of each line to their non-conductive state whereby said light emitting diodes are selectively energized to indicate the use status of said lines.

3,971,899

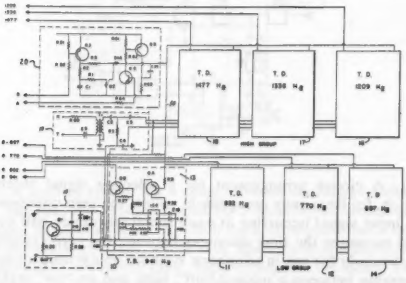
SIGNALLING DEVICE FOR KEY TELEPHONE SYSTEMS

Alexander C. McIntosh, P.O. Box 1673, Bellevue, Wash. 98009

Continuation-in-part of Ser. No. 569,396, April 18, 1975, Pat. No. 3,941,944. This application July 17, 1975, Ser. No. 596,960

Int. Cl.² H04M *1/50*

U.S. Cl. 179—99 **11 Claims**



1. A telephone signalling device comprising tone detection means responsive to calling signal tones occurring on a telephone line to which the device is connected, said signal tones emanating from one or more touch-tone telephones connected to said telephone line, said tone detection means including a plurality of tone detectors each having a phase lock loop element having a voltage controlled oscillator and means to generate an output signal proportional to the phase difference between the tone presented thereto and said voltage controlled oscillator, and latching transistor means connected to each phase lock loop element so as to latch the loop element in its operating state and hold the phase lock loop elements unresponsive to other tones while the latching transistor means is activated, means to activate said latching transistor means for a predetermined time period responsive to the reception of a set of signal tones by said tone detectors, and a matrix of switching elements selectively activated by said tone detection means, said switching elements each being connected to a telephone instrument and actuating an indicator at said telephone instrument.

3,971,900

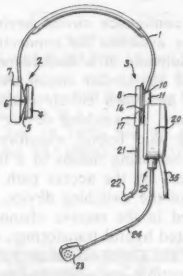
COMMUNICATIONS HEADSET WITH ROTATABLE AND TILTABLE ELECTRICAL CONNECTOR

James P. Foley, Astoria, N.Y., assignor to Roanwell Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 555,529, March 5, 1975. This application June 26, 1975, Ser. No. 590,592

Int. Cl.² H04M *1/05*; H01R *39/08*

U.S. Cl. 179—156 A **7 Claims**



1. A reversible headset comprising:

a. headband means for supporting the headset on a wearer's head, said headband means including a yoke adapted to extend transversely over the wearer's head;

b. boom means projecting forwardly from one end of the yoke;

c. housing means supported on the projecting boom means;

d. a reversible microphone;

e. electrical connector means supported on said housing means;

f. conduit having one end supporting the microphone and the other end supported by the connector means, said conduit being curved so that the microphone is disposed laterally of the housing means;

g. conductor means connected at one end to the microphone and extending through the connector means into the housing means; and

h. articulated means in the connector means supporting the conduit for continuous rotation thereof about one axis and tilting thereof about any axis transverse to said one axis to adjust the operating position of the microphone with respect to the wearer's mouth, while maintaining electrical connections between the microphone and the housing means.

3,971,901
COMMUNICATIONS HEADSET WITH REVERSIBLE MOUNTING MEANS

James P. Foley, Astoria, N.Y., assignor to Roanwell Corporation, New York, N.Y.

Filed Mar. 5, 1975, Ser. No. 555,529
Int. Cl.² H04M 1/05
U.S. Cl. 179—156 A 20 Claims

1. A reversible headset comprising:

a. headband means for supporting the headset on a wearer's head, including a pad adapted to engage either side of the head and having an aperture extending therethrough from front to back and open at both ends so that when said headband means is on a wearer's head, there is always a front opening aperture in the pad, whether the pad is on the left or right side of the head;

b. beam means having one end slidable into either end of said aperture so that when said one end of the beam means is inserted in the front end of the aperture, the other end of the beam means projects forwardly from the pad;

c. transducer housing means mounted on the forwardly projecting beam means;

d. an earphone transducer within the housing means; and

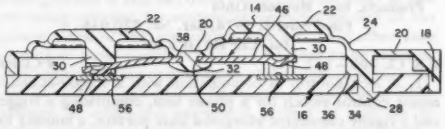
e. ear tube means having one end adapted to engage an ear of the wearer and defining an acoustic path between the ear and the transducer;

f. said headset being reversible from a first configuration in which the ear tube means is adjacent one of the wearer's ears to a second configuration in which the ear tube means is adjacent the other of the wearer's ears by removing the beam means from one end of the aperture and inserting it in the opposite end of the aperture.

3,971,902
KEYBOARD SWITCH ASSEMBLY HAVING ONE PIECE PLURAL PUSHBUTTON ACTUATOR AND RESILIENT MOUNTING STRUCTURE FOR PLURAL CANTILEVER BEAM CONTACTS

LaVern Dale Wulf, Harrisburg, and Henry William Demler, Jr., Lebanon, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 21, 1975, Ser. No. 560,858
Int. Cl.² H01H 13/14, 1/28
U.S. Cl. 200—5 A 2 Claims



1. A data entry keyboard system, comprising: a. a base member of insulating material having deposited thereon a plurality of spaced, first electrical contacts arranged in two spaced, parallel rows, and a second electrical contact positioned at an end of and between the two rows, said first and second contacts adapted for connection to electrical circuits;

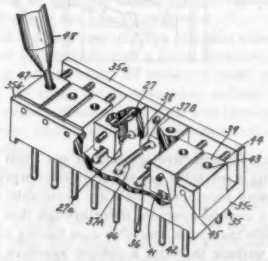
b. an electrically conductive and resilient contact strip having an elongated central bar with depending legs at either end and cantilever beams spaced along either side of and laterally extending from the central bar, said legs being fixed to the base member with one leg in engagement with the second electrical contact and with the central bar and cantilever beams spaced above the plurality of first electrical contacts with the ends of the beam being in alignment therewith, and further said central bar having a plurality of apertures spaced therealong; and

c. a single molded sheet of resilient material positioned over the contact strip and fastened to the base member at the edges thereof to define a cavity containing the contact strip, said molded sheet having on its upper surface a plurality of raised portions forming keys with a molded convex perimeter around each key and positioned intermediate the surface of the key and surface of the molded sheet, said convex perimeter biasing the key away from the base member, and a plurality of depending studs each positioned under a key and in alignment with the ends of the cantilever beams so that as a key is depressed the stud pushes the end of the beam into contact with the first electrical contact positioned therebelow so that an electrical circuit may be completed between the first electrical contact and the second electrical contact, further said molded sheet having depending therefrom a plurality of retaining means adapted to be received in the apertures so as to attach the central bar to the molded sheet, said retaining means having a resiliently deformable nose of greater diameter than the aperture and an annular groove behind the nose to receive the wall defining the aperture.

3,971,903
MULTI SLIDER SWITCH

Jerzy J. Wilentchik, 222 Lake Ave., Yonkers, N.Y. 10701

Filed Nov. 25, 1974, Ser. No. 526,908
Int. Cl.² H01H 15/06
U.S. Cl. 200—16 C 20 Claims



1. A switching device adaptable to a variety of switch functions comprising in combination:

an insulating board; a plurality of conductors arranged on said board according to a predetermined, repetitive pattern separated from each other by a plurality of insulative gaps, the latter substantially narrower than the width of said conductors; an insulating cover having a rectangularly shaped flat mid-section with perpendicular sides for enclosing said conductors and said insulative gaps and for retaining said board in a spaced, parallel relationship with said midsection, said midsection having a plurality of slots located opposite said gaps, forming edges parallel to one of said sides in accordance with said conductor pattern; at least one slider having internal and external portions separated by a groove parallel to said midsection, said external portion being manually displaceable along the length of one of said slot edges, extending into said groove for the purpose of retaining said slider in said slot

and for guiding its displacement therealong; said internal slider portion being located between said board and said midsection, extending to within close proximity of said conductors and having a bore perpendicular to said board and to said midsection; a spring loaded contact substantially wider than the width of said gap, protruding out of said bore, positioned by the surfaces forming said bore along the length and in conductive engagement with respective ones of said conductors coincidently to displacement of said slider along said slot edges; index means comprised of a spring loaded projection in said slider and of a plurality of indentations in said cover, said projection being adapted to protrude yieldingly into one of said indentations coincidently with said contact being stationed astride a respective pair of conductors on either side of said gap; and terminal means connected to said conductors accessible from outside of said cover.

3,971,904

SWITCH ASSEMBLY FOR GAS TAP ASSEMBLY HAVING CAM OPERATED LEAF SPRING CONTACTS AND SPLIT HOUSING CAM DETENT STOP

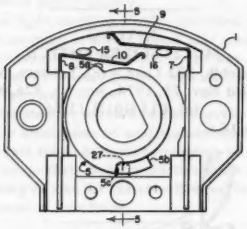
William Edward Ward, Clanfield, England, assignor to Illinois Tool Works Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 517,270, Oct. 23, 1974, abandoned. This application May 22, 1975, Ser. No. 580,084

Claims priority, application United Kingdom, Oct. 23, 1974, 49303/74

Int. Cl.² H01H *21/80, 9/06*

U.S. Cl. 200—6 BB **8 Claims**



1. A switch for selective ignition of gas from a gas tap assembly having a rotatable gas tap spindle comprising first and second housing members which are securable together and which have a central aperture therethrough that receives said gas tap spindle therein, a rotatable cam having a cam member with a cam surface thereon, a central aperture in said rotatable cam for receiving said gas tap spindle, a locking means for locking said cam onto said gas tap spindle, and an extension segment in said rotatable cam narrower than said cam surface, first and second L-shaped contact members each having a terminal portion and a contact portion, the contact portion of one of said contact members being positioned to overlie the contact portion of said other contact member and both of said contact members being disposed to overlie said cam so that said cam surface and extension segment control the position of the lower contact portion with respect to the upper contact portion, and a stop member on one of said housing members for limiting rotation of said cam of a width which allows said extension segment to rotate past said stop member for a limited portion of the rotation of said cam during which said contact members are disengaged, with said cam surface being of a length such that said contacts are in engagement over substantially the remaining portion of rotation of said cam between its two extreme positions of rotation.

3,971,905

SWITCH FOR A PRINTED OR LIKE CIRCUIT

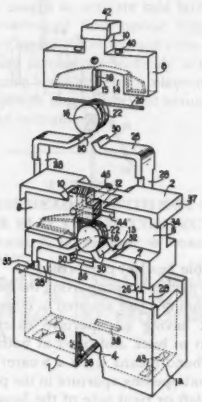
Jacques Delaage, Paris, France, assignor to Societe d'Etudes et de Construction de Materiel Electronique - S.E.C.M.E., Paris, France

Filed Mar. 12, 1975, Ser. No. 557,577

Claims priority, application France, Mar. 20, 1974, 74.09422

Int. Cl.² H01H *15/18*

U.S. Cl. 200—77 **12 Claims**



1. A switch for a printed or like circuit comprising a housing having an end wall and, disposed inside the housing: two metal contact means in projecting relation to the end wall of the housing, pins extending out of the housing and respectively connected to said metal contact means, means defining a rectilinear slideway substantially parallel to the end wall of the housing and means defining an aperture in the slideway in the region of the metal contact means, a flat slide of electrically insulating material movable in the slideway in a plane and comprising on one side of the slide an actuating means accessible from outside the housing and in an opposite side of the slide means defining a cavity, a freely rotatable contact roller disposed in the cavity, a spring supported in the slide and engaging the contact roller for elastically biasing the roller outwardly of the cavity, the cavity of the slide having two confronting lateral surfaces located on opposite sides of the contact roller and capable of coming selectively in contact with the contact roller, one of the lateral surfaces contacting the contact roller and urging the contact roller to a position in which the contact roller interconnects said contact means when the slide is urged in one direction to a first position by the actuating means and the other of the lateral surfaces contacting the contact roller and urging the contact roller to a position of rest out of contact with said contact means when the slide is urged in an opposite direction to a second position.

3,971,906

TRIGGER-LOCK CONTROL

Edward V. Sahrbacker, Brecksville, Ohio, assignor to Lucerne Products, Inc., Hudson, Ohio

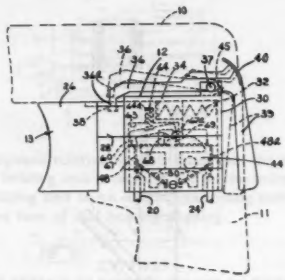
Filed Nov. 1, 1974, Ser. No. 520,016

Int. Cl.² H01H *3/20*

U.S. Cl. 200—157 **4 Claims**

1. A lock control in combination with a trigger-actuated motor control switch for a power tool, comprising a trigger and a rigidly connected elongated slide portion, a housing for switch components, said slide portion reciprocatably mounted in said housing, said switch components in said housing including separated electrical power-on and power-off contacts longitudinally aligned along said slide portion, means opera-

tively connected with said slide portion for moving horizontally between said contacts for changing connection with said contacts upon reciprocation of said slide portion, spring means urging said trigger and slide portion in a first predetermined contact position relative to one of said contacts, said slide portion being reciprocatable to a second contact position relative to the other of said contacts, a locking member on said slide portion near the upper edge thereof to lock said slide portion when said tool is in non-working position, an oscillat-



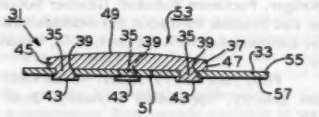
able lever providing lock means having a horizontal pivot on the top of said housing guiding said lock means into engagement with said locking member when said slide portion is in one of said contact positions, and an actuator member integral with said oscillatable lever and having an actuatingly engageable portion easily operated by a hand grasping said tool; whereby an operator may grasp said tool and move said actuator member to disengage said lock means from said locking member, and then by said trigger, reciprocate said slide portion into said second contact position.

3,971,907

ELECTRICAL ASSEMBLY, ELECTRICAL CONTACT AND METHOD OF MOUNTING AN ELECTRICAL CONTACT

David C. Lennon, Morrison, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed Feb. 22, 1974, Ser. No. 445,300
Int. Cl.[2] H01R 9/00
U.S. Cl. 200—238 **12 Claims**



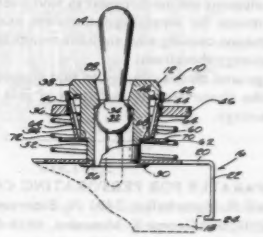
1. An electrical contact adapted to be mounted to a supporting member having generally opposite sides with a plurality of predeterminately spaced openings extending therebetween, said electrical contact comprising a contact body having a pair of generally opposite faces, one of said faces being adapted for electrical contacting engagement to effect electrical energization of said electrical contact and the other of said faces being adapted for seating engagement on one of the opposite sides of the supporting member, said other face including an outer peripheral portion adapted to be clamped tightly against the one opposite side of the supporting member so as to prevent deforming displacement movement away therefrom of said outer peripheral portion in response to bending moments created in said contact body upon the generation of heat in said electrical contact when it is electrically energized, a plurality of integrally formed means on said contact body and predeterminately disposed in spaced apart relation at least closely adjacent said outer peripheral portion for respectively extending through the openings in the supporting member when said other face is in seating engagement with the one opposite side of the supporting member, and said integrally formed means including means for deformation into clamping engagement with the other of the opposite sides of the supporting member generally about the openings thereof and at least in part spaced in overlaying relation with said outer peripheral portion so as to tightly clamp it against the one opposite side in opposition to the deforming displacement movement away therefrom occasioned in response to the bending moments created in said contact body upon the heating of said electrical contact when it is electrically energized.

3,971,908

SNAP-IN ARRANGEMENT FOR MOUNTING DEVICES IN A SUPPORT PANEL APERTURE

Earl T. Piber, Oconomowoc, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Apr. 3, 1975, Ser. No. 564,747
Int. Cl.[2] H01H 9/02
U.S. Cl. 200—296 **7 Claims**



1. A snap-in mounting assembly for an electrical device adapting the device to be mounted from the back of and through an aperture in a support panel to secure the device to the panel so that an operator element of the device is accessible from the front of the panel comprising

an elongated bushing carrying the operator element of the device and inserted through a panel aperture, said bushing having a main body, an enlarged outer end portion including an inner ledge extending radially outwardly from the outer surface of said body and terminating in an outer corner, and an annular slot located in the underside of said ledge;

a retainer having an annular base slidably mounted on said bushing for relative axial and axially movable thereon, a plurality of resilient fingers connected to and normally extending axially in an outwardly diverging direction from said base and being radially compressible between a normally expanded position where their outer free ends extend radially outwardly beyond the outer periphery of said bushing outer end portion and beyond the inner periphery of the panel aperture and a radially inwardly compressed position where their outer free ends are releasably held in said slot prior to mountig the electrical device on the panel, and said retainer has abutment means removing abutting the back of the panel to limit axial movement of said retainer relative to the panel as said bushing is inserted into the panel aperture during mounting so that, upon continued axial movement of said bushing through the panel aperture, axial movement of said bushing relative to said retainer causes said free ends of said fingers to be released from said slot, allowing said fingers to return to said expanded position; and

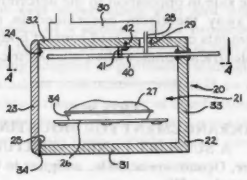
means for biasing said bushing in an axial direction away from the back of the panel to wedge said fingers between said ledge outer corner and the inner wall of the panel aperture, thereby locking the device on the panel.

3,971,909

MICROWAVE OVEN ANTENNA

William L. Wallick, 7414 Leescott Ave., Van Nuys, Calif. 91406

Filed Mar. 31, 1975, Ser. No. 563,646
Int. Cl.² H05B 9/06
U.S. Cl. 219—10.55 F 6 Claims



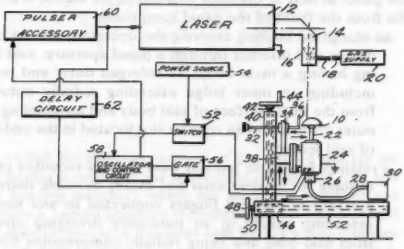
1. An oven comprising
a. means for defining an oven cavity;
b. element means disposed in said oven cavity;
c. means for supplying microwave energy to said element means causing said element means to radiate microwave energy therefrom;
d. ground means coupled to said element means for altering the phase angle of radiation of said radiated microwave energy.

3,971,910

APPARATUS FOR PERFORATING CONTACT LENSES

Cornell S. Marschalko, 3401 N. Emerson St., Arlington, Va. 22207, and George K. Meszaros, 4616 48th St., NW., Washington, D.C. 20016

Division of Ser. No. 173,612, Aug. 20, 1971. This application Jan. 16, 1975, Ser. No. 541,692
Int. Cl.² B23K 27/00
U.S. Cl. 219—121 L 4 Claims



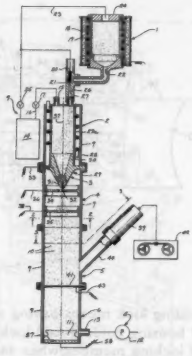
1. Apparatus for forming holes through a contact lens comprising: means for generating a laser beam capable of forming a hole through a contact lens; a carriage; means for supporting said carriage and for adjusting the position of the same along a path extending normal to the direction of the laser beam; an electric motor fixed to said carriage; a hollow open-ended index shaft of lesser diameter than a contact lens arranged coaxial with said motor, said index shaft being supported by and rotatably driven about its axis by said motor; motor control means for controlling said motor to index said shaft about its axis; means for applying a vacuum to the interior of the shaft whereby a contact lens placed on the open end of the index shaft will be held in contact with said end; a lens centering device supported by said carriage, said device including a lens-engagable member adjustable toward and away from the axis of said index shaft for engaging the edge of a contact lens to thereby center the lens with respect to said index shaft.

3,971,911

PROJECTION FORMING OF THREE-DIMENSIONAL METAL OBJECTS

Fred M. Dann, 130 Cliff, Sun Prairie, Wis. 53590, and James Reigel, 4725 Cottage Grove Road, Madison, Wis. 53716

Division of Ser. No. 374,307, June 28, 1973, Pat. No. 3,892,506. This application Apr. 15, 1975, Ser. No. 568,254
Int. Cl.² C21D 1/40
U.S. Cl. 219—162 8 Claims



1. A process for projection forming of a three-dimensional object from metallic particles such as metal powder and the like, comprising the steps of:
a. forming a moving stream of the said particles,
b. heating said stream of particles to a coherent bonding state,
c. continuously imposing a variable two-dimensional planular image on the stream of heated particles,
d. and subsequently causing said particles to impinge on a target and build up a three-dimensional object corresponding in shape to the image continuously imposed in step (c).

3,971,912

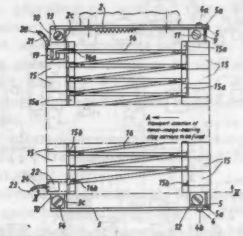
FIXING ARRANGEMENT FOR FUSING TOWER IMAGES

Wilm Krüger, Puchheim-Bahnhof; Günther Schatka, Pfaffenhofen, and Joachim Pietruska, Furstenfeldbruck, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed June 23, 1975, Ser. No. 589,067
Claims priority, application Germany, June 21, 1974, 2429734
Int. Cl.² H05B 1/00; G03G 15/20
U.S. Cl. 219—216 11 Claims

1. In a copying machine wherein a toner-image-bearing copy carrier moves in a predetermined direction along a predetermined transport path, an arrangement for fixing toner images by fusing the toner thereof, comprising, in combination, a heating winding having a plurality of turns; and holding means comprising a plurality of discrete holding units each engaging and holding at least one respective one of said turns, said discrete holding units being arranged in two spaced groups, and said turns of said heating winding extending in a plurality of stretches from one group to the other in the direction of said transport path for heating the toner on copy carriers passing therealong, wherein said discrete holding units of the one group are arranged in a first row and those of the other group in a second row parallel to and spaced from said first row, with both rows extending transverse to the direction of said transport path, wherein said discrete holding units are each provided with a holding portion defining a holding open-

ing through which passes one of the turns of said heating winding, the opening having an unblocked end, and wherein the discrete holding units of each of said rows are so configu-



rated and disposed relative to each other that the unblocked end of each holding unit is blocked off by the material of an adjoining holding unit to an extent preventing falling out of the respective turn of said heating winding.

3,971,913

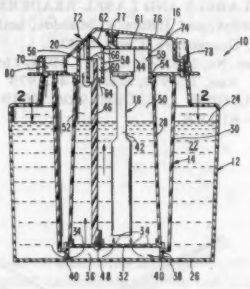
NON-SPLITTING ELECTRIC ROOM VAPORIZER

Paal Myklebust, Baraboo, Wis., assignor to Gerber Products Company, Fremont, Mich.

Filed July 26, 1974, Ser. No. 491,971

Int. Cl.[2] H05B *3/60*; A61L *9/02*; F22B *1/30*

U.S. Cl. 219—284 **4 Claims**



1. A vaporizer comprising: an open top receptacle adapted to receive water to be vaporized to steam; a subhousing having a perforate bottom and removably disposed in said receptacle, said subhousing being provided with a top member for closing the top of the receptacle when the subhousing is disposed therewithin; a continuous, first, upright partition in said subhousing extending from the bottom thereof to near but spaced relation to said top member for dividing said subhousing into a first and a second chamber;

said first chamber being in communication with the receptacle through the perforate bottom of said subhousing; electrode means carried by said top member and extending into said first chamber for vaporizing water; second and third generally parallel partitions secured to and extending downwardly from said top member into respective ones of said first and second chambers on opposite sides of and spaced from said first partition and said subhousing bottom, said top member having an orifice in fluid connection with said second chamber at a location spaced from said third partition, each said second and third partition being of a length sufficient to provide, in combination with said first partition, a serpentine path from the electrodes in said first chamber to the orifice in said second chamber, whereby any steam generated in said first chamber must flow along said serpentine path toward said orifice, thereby tending to be freed of any entrapped water particles prior to egress from said orifice.

3,971,914

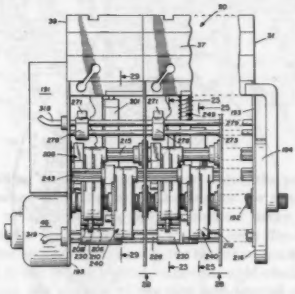
VOTING MACHINE

Cothburn M. O'Neal, Dallas; Alfred M. Mayo, Richardson, both of Tex., and George William Childs, deceased, late of Dallas, Tex. (by Patricia M. Childs, executrix), assignors to Riverside Press, Inc., Dallas, Tex.

Division of Ser. No. 309,174, Nov. 24, 1972, Pat. No. 3,866,826. This application May 28, 1974, Ser. No. 473,922

Int. Cl.[2] G07C *13/00*

U.S. Cl. 235—54 R **1 Claim**



1. A voting machine having a plurality of aligned rows of voting keys arranged within a frame member, said keys being movable between a non-voted and a voted position to register vote selections; a card punch mechanism actuable by said keys in said voted position; and a tally mechanism actuable by said keys; comprising:

electrical motor drive means for operating said machine;

a drive shaft connected to said motor drive means for rotative motion; and

main registering means for registering the vote selections by sequencing the machine through a vote register cycle including a vote registration electrical switch in communication with said drive motor for electrically activating said motor drive means to drive said machine through said vote registration cycle, first means in communication with said drive shaft for engaging said keys in the voted position with said card punch mechanism and said tally means to register said voted selections, and clear means in communication with said drive shaft for engaging said voted keys to move said voted keys to said unvoted position.

3,971,915

SUN ANGLE CALCULATOR

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Anne Flippin, Friendswood, and Arthur L. Schmitt, Dickinson, both of Tex.

Filed Dec. 11, 1974, Ser. No. 531,576

Int. Cl.[2] G06C *27/00*

U.S. Cl. 235—61 NV **2 Claims**

1. Apparatus for determining the angle of sun elevation for a particular geographical location at a given time and date, said apparatus comprising:

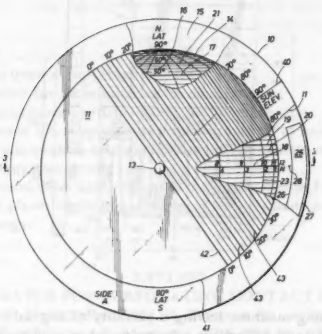
a circularly shaped base member having a central axis, said base member having on one side thereof a first set of indicia in the form of parallel lines arranged within a circular area for representation of latitudes between locations in said circular area representative of North and South poles of the earth, a second set of indicia on said

base member which are in the form of elliptical curve lines extending as meridians between said North and South pole locations and arranged for representation of Solar Time values;

a transparent plate superposed on said base member and mounted for rotation about said central axis, said transparent plate having a third set of indicia in the form of parallel lines on one-half of said plate arranged as lines of latitude for representation of sun angle,

said first and third sets of parallel line indicia being proportioned in degrees of latitude and being capable of a matching overlay in one position of said transparent plate member relative to said base member;

a perpendicular sun elevation line inscribed on said transparent plate extending radially of said central axis and



perpendicular to the parallel lines of said third set of indicia in a position which would bisect said third set of indicia, and a fourth set of date scale indicia arcuately disposed to either side of the equator line of said first set of latitudes indicia, said fourth set of indicia being scaled relative to said central axis to represent solar declination for the days of the year; and

whereby said transparent plate may be oriented with the radial sun elevation line coincident with an indicium representing said given date in the date scale indicia to compensate for solar declination and thereby indicate the sun angle for said geographical location as indicated by the location relative to said sun angle indicia of the intersection point of the elliptical curve line corresponding to solar time at the geographical location with the line representing latitude of said geographical location.

3,971,916

METHODS OF DATA STORAGE AND DATA STORAGE SYSTEMS

Roland Moreno, Paris, France, assignor to Societe Internationale, France

Filed Mar. 21, 1975, Ser. No. 560,873

Claims priority, application France, Mar. 25, 1974, 74.10191; Mar. 17, 1975, 75.08184; Mar. 17, 1975, 75.08185

Int. Cl.[2] G06K *5/00, 1/14, 19/00;* **G06F** *7/02*

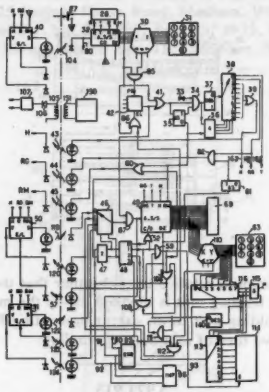
U.S. Cl. 235—61.7 B **38 Claims**

1. A data storage system comprising at least one portable electronic device and at least one data-transfer device, characterized in that said portable electronic device comprises:

readily portable plural-section, addressable data memory means;

coupling means operable temporarily to connect said memory means with said data transfer means;

memory control circuits interconnected with the coupling means and with the memory means; said memory means and said control circuits being constructed in the form of logic microstructures; and in that said data transfer device comprises data transfer means operable to transfer data into said memory means;



said system being further characterized by inhibitor means preventing the transfer of data of predetermined sections of said memory means.

3,971,917

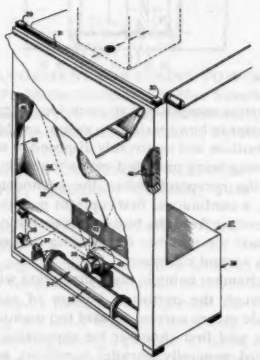
LABELS AND LABEL READERS

James A. Maddox, and Jeffery R. Maddox, both of R.F.D. 2, Church St., Georgetown, Conn. 06829

Division of Ser. No. 175,672, Aug. 27, 1971. This application Aug. 1, 1974, Ser. No. 493,978

Int. Cl.[2] G06K *7/10;* **G08C** *9/06;* **G03B** *21/28*

U.S. Cl. 235—61.11 E **5 Claims**



1. Label reader apparatus for reading and translating an encoded lable having a plurality of discrete bands of contrasting radiation reflectivity levels, comprising:

A. a source of radiation for impingement upon the coded label;

B. a scanning slit juxtaposed in spaced relationship to said readiation source;

C. a movable beam redirecting surface adapted for projecting and sweeping the projected radiation beam across the scanning slit, comprising

1. a polygonal shaped mirror drum having
   a. a polygonal shaped support comprising a polygonal cylinder having a plurality of substantially flat circumferential surfaces, and
   b. a plurality of mirrors respectively adjustably mounted to the circumferential surfaces of the support, assuring sweeping movement of said beam by said plurality of surfaces in substantially the same plane, and
2. a motor connected to said mirror drum for rotation thereof;

D. a label information assembly comprising:
   a. means for translating the reflected radiation into an output signal, and
   b. a label-reading sub-assembly for determining when the label code has been read; and

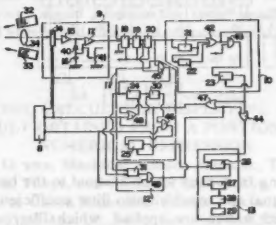
E. a light pipe positioned between said movable beam redirecting surface and said scanning slit and adapted for receiving the label reflections and directing the label reflections toward the label information assembly.

3,971,918

METHOD AND APPARATUS FOR MEASURING THE NUMBER OF STACKED CORRUGATED CARDBOARDS

Minoru Saito, Odawara, Japan, assignor to Nihon Electronic Industry Co. Ltd., Japan

Filed Dec. 12, 1974, Ser. No. 532,081
Claims priority, application Japan, Dec. 28, 1973, 49-2654
Int. Cl.² G06M 9/00
U.S. Cl. 235—92 SB **9 Claims**



1. In a method of measuring the number of a plurality of stacked corrugated cardboards wherein one end of the stack is scanned vertically by means of a scanning light beam so as to successively detect the flat sheets and the corrugated sheets of the corrugated cardboards, wherein the improvement comprises scanning horizontally one end of the stack in the range of a predetermined width by a photoelectric sensor, said sensor including a plurality of linearly arranged photodiodes, sequentially actuating said photodiodes in linear order by electric pulses, detecting the results of the horizontal scanning of a flat base sheet of at least one of the corrugated cardboards, detecting the result of the horizontal scanning of the corrugated sheet of at least one of said corrugated cardboards, detecting the result of the horizontal scanning of a wavy base sheet of at least one of the corrugated cardboards, and operating a means for counting in accordance with the results of said three detecting operations.

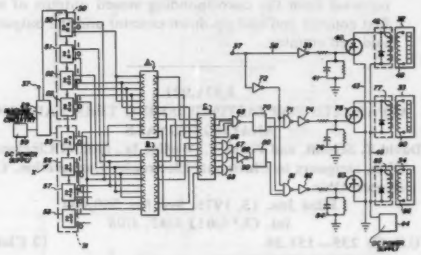
3,971,919

PROGRAMMABLE BILLING SYSTEM

Louis J. Fantozzi, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 344,321, March 23, 1973, abandoned. This application Feb. 7, 1975, Ser. No. 548,037
Int. Cl.² G06B 27/06
U.S. Cl. 235—92 SB **1 Claim**

1. A programmable billing meter system for use in a copying machine including:
a counter arranged to receive a copy count pulse each time the machine produces a copy, and to store the copy count information, the counter including a series of flip-flops,
a plurality of billing meters, and
programmable means electrically interposed between the counter and the billing meters for enabling and disabling the meters upon the occurrences of predetermined copy counts whereby copy count information is entered into



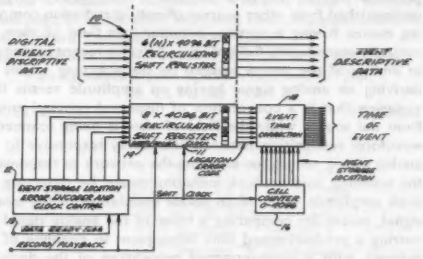
the billing meters in programmed order, the programmable means including a first connector for sensing the 0 state of each flip-flop in the counter array, a second connector for sensing the 1 state of each flip-flop in the counter array, a third connector having outputs which are gated to the billing meters, repositionable electrical leads between the outputs of the first and second connectors and the inputs of the third connector capable of being arranged in a programmed manner.

3,971,920

DIGITAL TIME-OFF-EVENT ENCODING SYSTEM

Robert P. Johnson, Granada Hills, Calif., assignor to The Bendix Corporation, North Hollywood, Calif.

Filed May 5, 1975, Ser. No. 574,830
Int. Cl.² H03K 21/00
U.S. Cl. 235—92 SH **7 Claims**



1. A shift register storage system for receiving and storing digital data words including a first storage register means and a clock operated at a fixed clock rate to produce pulses such that location of said data words in said register means reflects time of arrival of each said data word wherein the improvement comprises:
gating means to produce additional clock pulses in response to the arrival of data words,
a first counter to provide incremental digital time error data reflecting the difference between data arrival time and the time of said fixed clock pulses,
an up-down counter to tally any excess of said additional clock pulses over said fixed clock pulses,
switching means to prevent said fixed clock pulses from clocking said first shift register when said excess tally is other than zero,

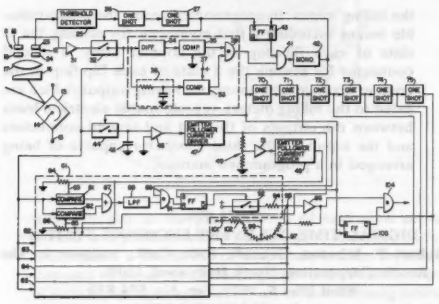
a cell counter synchronized with and having a counting capacity equal to the length of said first shift register means such that the output of said cell counter enumerates the cells of said first shift register means, and

additional shift register means synchronized with said first shift register means and said cell counter and receiving and storing the outputs of said first counter and said up-down counter such that the precise time of arrival of each stored data word may be calculated during data retrieval from the corresponding stored outputs of said first counter and said up-down counter and the output of said cell counter.

3,971,921
APPARATUS FOR DISTINGUISHING TIME VARYING ANALOG SIGNALS

David E. Schmit, and Frank L. Wedig, Jr., both of Cincinnati, Ohio, assignors to Cincinnati Electronics Corporation, Cincinnati, Ohio

Filed Jan. 13, 1975, Ser. No. 540,604
Int. Cl.² G01J 3/42, 3/08
U.S. Cl. 235—151.35 **12 Claims**



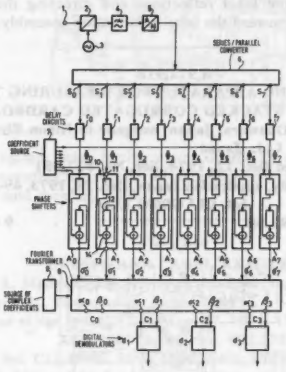
1. Apparatus for scanning a field of view and enabling a particular source of optical radiation in the field of view to be distinguished from other sources of optical radiation comprising means having a narrow instantaneous field of view for optically scanning the field of view, detector means responsive to energy of the source imaged by the scanning means for deriving an analog signal having an amplitude versus time variation that is a convolution of dispersed spectral energy from the source while the field of view is being scanned, a waveform recognition network selectively responsive to the analog signal, means for enabling the network in response to the scanning, said network including means for detecting the peak amplitude value of an initial undulation of the analog signal, means for comparing a value of the analog signal occurring a predetermined time subsequent to enabling of the network with a predetermined percentage of the detected peak amplitude value, and means responsive to the comparing means for signalling the presence of the particular source in the field of view.

3,971,922
CIRCUIT ARRANGEMENT FOR DIGITALLY PROCESSING A GIVEN NUMBER OF CHANNEL SIGNALS

Maurice Georges Bellanger, Antony, and Jacques Lucien Daguet, St.-Maur-des-Fosses, both of France, assignors to Telecommunications Radioelectriques et Telephoniques T.R.T., Paris, France

Filed Nov. 29, 1974, Ser. No. 528,506
Int. Cl.² G06F 7/38
U.S. Cl. 235—152 **10 Claims**

1. An arrangement for converting a single side-band frequency division multiplex signal into a corresponding base band channel signals, including a series parallel converter distributing binary coded signal samples (code words) of the multiplex signal equally in time in a cyclical manner over a given number of parallel signal paths while the signal samples in each of these signal paths occur at a frequency which is equal to the bandwidth of a channel signal in which arrangement each of the signal paths incorporates a delay circuit for eliminating the mutual time shifts of the signal samples applied within a cycle to said series parallel converter, a calculating member being provided in series with said delay circuit to which in addition to the output samples of the co-operating delay circuits a given number of filter coefficients is applied which are provided by a source for a given number of filter coefficients, the outputs of said calculating members being coupled to inputs of a discrete Fourier transformer whose outputs are connected to demodulators characterized in that each calculating member is formed as a recursive digital filter to which binary coded signal samples are applied having an



input sampling frequency which is equal to the bandwidth of a channel signal and to which also filter coefficients originating from said source are applied, which filter coefficients characterize an amplitude-frequency characteristic of a low-pass filter having a cut-off frequency which corresponds to the half bandwidth of a channel signal and which characterize a phase-frequency characteristic, the phase-frequency characteristic indicating the difference between the phase-frequency characteristic of a calculating member and the phase-frequency characteristic of a calculating member connected to the output of a reference delay circuit, each recursive filter having a sawtooth-shaped characteristic which is constituted by straight lines varying with a given angle of inclination in a parallel manner and intersecting the frequency axis in case of integral multiples of the said input sampling frequency while the slope of said sawtooth characteristic is opposite to the slope of the phase-frequency characteristic of the co-operating delay circuit.

3,971,923
RAMP FUNCTION GENERATOR

John L. Linder, Las Cruces, N. Mex., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 436,415, Jan. 25, 1974. This application Mar. 31, 1975, Ser. No. 564,022
Int. Cl.² H03K 4/08; G06J 1/00
U.S. Cl. 235—150.53 **1 Claim**

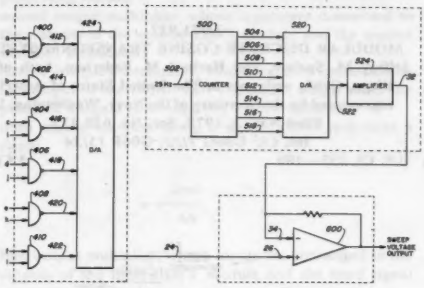
1. A circuit for generating a ramp function signal comprising:

a. means for providing a constant-frequency A-C signal having an output;

b. a multiple-bit binary counter circuit having an input and a plurality of outputs, said input being connected to said

output of said means for providing a constant frequency signal, said plurality of outputs having a digital signal thereon;

c. a digital-to-analog converter having a plurality of inputs and an output, said plurality of inputs being connected to said plurality of outputs of said multiple-bit counter such



that said digital signal is transmitted in parallel to said digital-to-analog converter, said output of said digital-to-analog converter being said ramp function signal, said counter counting up until filled and then returning to zero such that said digital-to-analog converter outputs a periodic ramp signal wherein the ramp signal starts each period at zero and ends each period at a maximum value.

3,971,924

ELECTRONIC CALCULATOR DISPLAYING A PARTIAL RESULT OBTAINED FROM A PORTION OF A NUMERICAL EXPRESSION

Masayoshi Ozawa, Machida; Minoru Machida, Tokyo; Yoichi Kawabata, Tokyo, and Mitsuaki Seki, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 30, 1974, Ser. No. 465,570

Claims priority, application Japan, May 7, 1973, 48-50907; May 7, 1973, 48-50908

Int. Cl.² G06F 7/38

U.S. Cl. 235—156 **5 Claims**

1. An electronic calculator comprising:

a keyboard having numerical keys, operator keys of addition, subtraction, multiplication and division, a left parenthesis key and a right parenthesis key;

first detecting means operative in response to the depression of said left parenthesis key for producing a first detection signal;

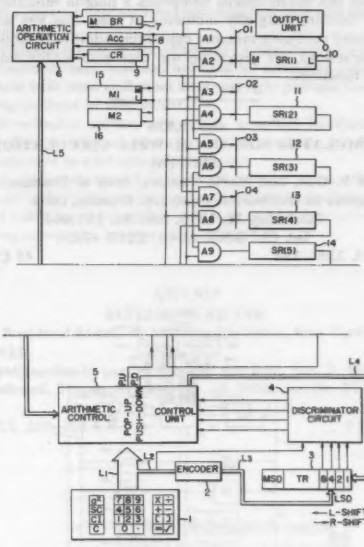
second detecting means operative in response to the depression of said right parenthesis key for producing a second detection signal;

a plurality of data register means for storing data from said numerical keys, said plurality of data register means comprising result register means for storing a partial result indicating output;

order register means for storing orders from said operator keys;

arithmetic control means operative in response to said first and second detection signals provided from said first and second detecting means, respectively, for performing partial result arithmetic operations on the data stored in the data register means during an interval defined by the depression of said left parenthesis key and said right parenthesis key, for producing a corresponding partial result indicating output, for transferring the output to said result register and for holding said partial result indicating output in said result register means until a subsequent depression of one of said operator keys; and

display means for displaying the contents of said result



register, said display means having an input coupled to receive the contents of said result register.

3,971,925

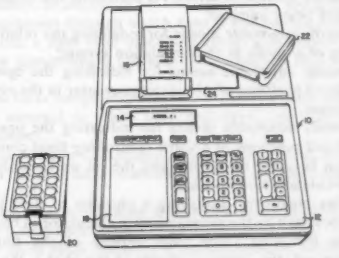
ADAPTABLE PROGRAMMED CALCULATOR HAVING PROVISION FOR PLUG-IN KEYBOARD AND MEMORY MODULES

Freddie W. Wenninger; Donald E. Morris; Jindrich Kohoutek; David S. Maitland; Douglas M. Clifford; Louis T. Schulte, and John C. Keith, all of Loveland, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 318,451, Dec. 26, 1972, abandoned. This application June 6, 1974, Ser. No. 477,552

Int. Cl.² G06F 15/06

U.S. Cl. 235—156 **42 Claims**



1. In an electronic calculator including a keyboard input unit for entering information into the calculator, a memory unit for storing sequences of instructions to be performed by the calculator in making selected calculations, computing means responsive to information from the keyboard input unit and to operating states within the calculator itself for selectively performing selected ones of the sequences of instruc-

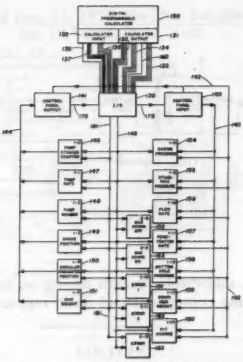
tions stored in the memory unit to make selected calculations employing data entered from the keyboard input unit and to give an output indication of the results of those calculations, wherein the improvement comprises a plug-in modular keyboard section, integrally including at least one key and an associated read-only memory containing additional sequences of instructions, for providing the user with additional keyboard functions.

3,971,926

SIMULATOR FOR AN OIL WELL CIRCULATION SYSTEM

Gerald S. Gau, and Mario Zamora, both of Houston, Tex., assignors to Halliburton Company, Duncan, Okla.

Filed May 28, 1975, Ser. No. 581,464
Int. Cl.[2] G06F *15/46*; E21B *47/04*
U.S. Cl. 235—184 **45 Claims**



1. In an apparatus for simulating the circulating of a fluid in the circulation system of an oil well extending from the surface of the earth to a point intersecting an underground formation, which apparatus is used in conjunction with a programmable digital calculator programmed to calculate fluid pressure at a plurality of points in the circulation system, wherein the apparatus includes:

manually adjustable means for indicating the pump rate of a pump in the circulation system;

manually adjustable means for indicating the density of the fluid being pumped;

manually adjustable means for indicating the relative opening of a choke in the circulation system;

manually adjustable means for indicating the opened and closed positions of a blowout preventer in the circulation system;

manually adjustable means for indicating the opened and closed positions of a valve controlling fluid communication between the choke and the oil well annulus in the circulation system; and,

display means for displaying a plurality of fluid pressures calculated by the programmable calculator in response to the indicated pump rate, density of the fluid being pumped, the relative opening of the choke, the position of the blowout preventer, and the position of the valve, wherein the display includes at least the fluid pressure in a standpipe and the fluid pressure in an oil well casing in the circulation system; the improvement comprising:

first circuit means, responsive to changes in the manually adjustable pump rate indicating means, for providing to the digital programmable calculator at least periodically a digital representation of the pump rate and a digital representation of a sum of pumping strokes for the pump in the circulation system; and,

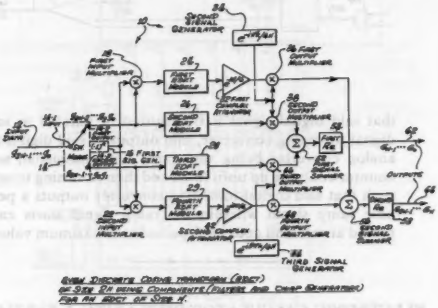
second circuit means, responsive to changes in the manually adjustable relative choke opening indicating means, for providing to the digital programmable calculator at least periodically a digital representation of the choke opening.

3,971,927

MODULAR DISCRETE COSINE TRANSFORM SYSTEM

Jeffrey M. Speiser, and Herbert M. Federhen, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 3, 1975, Ser. No. 628,433
Int. Cl.[2] G06G *7/22*; G06F *15/34*
U.S. Cl. 235—186 **3 Claims**



1. Apparatus for performing an even discrete cosine transform (EDCT) on an input signal of size 2N, with components for an EDCT of size N, comprising:

switching means, having an input and two alternately energized outputs, a first output and a second output, for distributing data points $g_0, \ldots, g_{2N-1}$ of an input signal, the last data points $g_N, \ldots, g_{2N-1}$ being made zeroes.

means for generating a signal $(-1)^n$, $n = 0, 1, \ldots, 2N-1$;

a first input multiplier, whose two inputs are connected to the first output of the switching means and to the signal generating means;

a second input multiplier, whose two inputs are connected to the second output of the switching means and to the signal generating means;

a first EDFT module, whose input is connected to the output of the first input multiplier, which performs a discrete Fourier transform (DFT) on its input signal;

a second EDFT module, substantially identical to the first module, whose input is connected to the first output of the switching means;

a third EDFT module, substantially identical to the first module, whose input is connected to the second input of the switching means;

a fourth EDFT module, substantially identical to the first module, whose input is connected to the output of the second input multiplier;

a first complex attenuator, whose input is connected to the output of the first EDFT module, which shifts the phase of a signal at its input by $-\pi/4$ radians;

a second means for generating a signal, which generates a signal

$$e^{\frac{i\pi k}{4N}},$$

$k = 0, 1, \ldots, 2N-1$;

a first output multiplier, whose inputs are connected to the outputs of the first phase shifters and the second signal generating means;

a second output multiplier, whose inputs are connected to the outputs of the second EDFT module and the second complex attenuator;

a second complex attenuator, whose input is connected to the output of the fourth EDFT module, which shifts the phase of a signal at its input by $-3\pi/4$ radians;

a third means for generating a signal, which generates a signal

$$e^{\frac{i3\pi k}{4N}};$$

a third output multiplier, whose inputs are connected to the outputs of the third EDFT module and the third signal generating means;

a fourth output multiplier, whose inputs are connected to the outputs of the second complex attenuator and the third signal generating means;

a first signal summer, whose two inputs are the outputs of the second and third output multipliers;

first circuit for taking the real part of an input signal, connected to the output of the first signal summer, the output signal being $G_0, \ldots, G_{N-1}$, the first N terms of the even discrete cosine transform;

a second signal summer, whose two inputs are the outputs of the first and fourth output multipliers; and

second circuit for taking the real part of an input signal, connected to the output of the second signal summer, the output signal being $G_N, \ldots, G_{2N-1}$, the last N terms of the even discrete cosine transform.

3,971,928

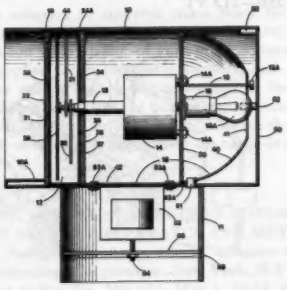
DISPLAY SYSTEM

Jordan Kirsch, 78 Huron Ave., and James L. Hamilton, 21 Stearns St., both of Cambridge, Mass. 02138

Filed Apr. 10, 1974, Ser. No. 459,660

Int. Cl.² F21V *33/00*; **G01D** *11/28*; **G04B** *47/00*

U.S. Cl. 240—2.1 **8 Claims**



1. An assembly including,

a housing having opposite ends,

a plurality of movable members within the housing,

a motor and shaft supporting said movable members and positioned within said housing with said movable members adjacent one end of the housing,

a light source within the housing and comprising a single bulb adjacent the other end of said housing,

at least one light diffusing sheet extending across the housing intermediate said movable members and said bulb and motor,

a reflector system at the other end of said housing partially enclosing said bulb and oriented for reflecting light from said bulb onto said sheet with said light partially converging in front of said motor,

said reflector system comprising a partial hemispherical reflective element and a cylindrical member coaxial and adjacent to said reflective element,

said motor positioned within said cylindrical member and said bulb positioned within said hemispherical element,

and a diffuser intermediate said bulb and motor and extending across the interior of said housing.

3,971,929

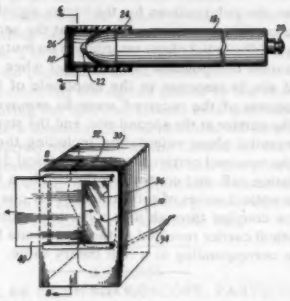
SAFELIGHT FILTER

John Buckland Erdell, 50 Morningside Drive, New York, N.Y. 10025

Continuation-in-part of Ser. No. 429,860, Jan. 2, 1974, abandoned. This application Apr. 28, 1975, Ser. No. 571,985

Int. Cl.² F21V *9/00*; **F21L** *15/04*

U.S. Cl. 240—10.6 R **9 Claims**



1. In a darkroom safelight for color film processing, having a light source, an enclosure for said light source and a window in said enclosure through which light is transmitted from the light source, a light filter extending across said window, said light filter comprising a plurality of superposed filter layers, namely:

a. a first filter comprising at least one layer of color negative film exposed to white light and developed with color developer,

b. a second filter comprising at least one layer of magenta color filter with a minimum density of approximately 10%, and

c. a third filter comprising at least one layer of color filter with a minimum density of approximately 10%,

d. said third filter being of a complementary subtractive color relative to the color magenta.

5. The combination of claim 1, wherein:

the light source and enclosure therefor consist of a portable battery-powered flashlight.

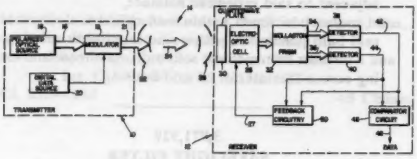
6. The combination of claim 1, wherein:

the light source and enclosure therefor consist of a light fixture mechanically supported in a darkroom and containing an incandescent lamp of low power, of the order of 15 watts.

3,971,930
POLARIZATION COMPENSATOR FOR OPTICAL COMMUNICATIONS

Michael W. Fitzmaurice, Gambrills, Md., and James B. Abshire, Greeneville, Tenn., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 24, 1974, Ser. No. 463,925
Int. Cl.² H04B 9/00
U.S. Cl. 250—199 **13 Claims**

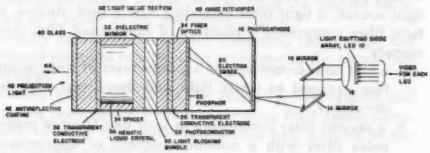


1. A method of transmitting digital data from a first site to a second site comprising: at the first site, polarization modulating an optical carrier from a polarizing energy source to a selected one of a pair of values in response to an input of a binary signal value from a binary signal producing means; transmitting the modulated carrier from the first site to the second site via an optical path that distorts the polarization state of the carrier in a random manner to introduce cross-talk between the polarizations for the binary signal values; receiving the carrier containing cross-talk at the second site; introducing a differential phase retardation on mutually orthogonal polarization components of the carrier when received at the second site in response to the amplitude of the polarization components of the received wave to remove the cross-talk from the carrier at the second site; and the step of introducing a differential phase retardation including the steps of; coupling the received carrier through an optical differential phase retardation cell, and controlling the cell by a feedback means so that optical waves of substantially only one linear polarization are coupled through it at a particular time instant when the optical carrier received at the second site has a first polarization corresponding to a first binary value.

3,971,931
LED IMAGE TUBE LIGHT VALVE

Robert E. Jehle, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 23, 1975, Ser. No. 543,383
Int. Cl.² G02F 1/13
U.S. Cl. 250—213 R **8 Claims**

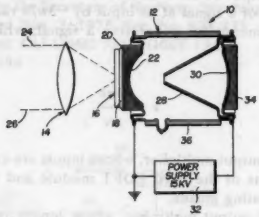


1. A light projection device for transforming a dim, high resolution image into a bright, high resolution image for projection onto a screen, comprising:
- a linear array of light emitting means for producing said dim, high resolution image;
- image intensifier means for producing an intensified image from said dim, high resolution image;
- a fiber optic plate connected to said image intensifier means to transversely convey said intensified image;
- light valve means for transforming said intensified image into an electrical potential gradient and a gradient of transparency proportional to said intensified image to control the gradient of intensity of a high intensity projection light to produce said bright, high resolution image.

3,971,932
APPARATUS FOR ENHANCING THE LONG WAVELENGTH RESPONSE OF PHOTODETECTORS

Kenneth G. Sewell, Dallas, and William B. Volz, Richardson, both of Tex., assignors to Varo, Inc., Garland, Tex.

Filed Dec. 2, 1974, Ser. No. 528,806
Int. Cl.² H01J 31/50
U.S. Cl. 250—213 VT **12 Claims**

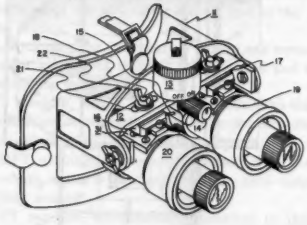


1. Photodetection apparatus comprising: photosensitive means usefully responsive to electromagnetic energy in a first wavelength region; passive energy conversion means for receiving electromagnetic energy of a wavelength longer than said first wavelength region and in a region to which said photosensitive means is insensitive and emitting electromagnetic energy in said first wavelength region in response thereto, said energy conversion means being substantially optically transparent to radiations in said first wavelength region; and means optically coupling said energy conversion means to said photosensitive means, whereby said photosensitive means provides information concerning incident electromagnetic energy in both said first wavelength region and at said longer wavelength.

3,971,933
QUICK DISCONNECT FOR NIGHT VISION OPTICS

James R. Adamson, Jr., Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 18, 1975, Ser. No. 588,091
Int. Cl.² H01J 31/50
U.S. Cl. 250—213 VT **4 Claims**



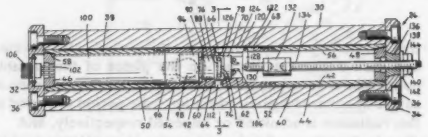
1. An image intensifier which converts a low light light level (invisible) image to a visible image comprising:
- a support member including;
  - an electrical power source attached to said support member having at least one electrical terminal,
  - a female bayonet socket, also attached to said support member, and
  - at least one resilient electrical contact mounted in said socket connected to said one terminal,

an optical unit mated to said female socket including;
an electrical image intensifier tube,
a lens means mounted on said tube to focus at least the invisible image in said intensifier tube,
a male bayonet member complimentary in shape and mated with said female member rigidily attached to said tube and lens means, and
a rigid electrical contact mounted on said male member oriented to press on said resilient contact as said male and female members are mated.

3,971,934
PHOTOELASTIC LOAD MEASUREMENT ALARM DEVICE

Joseph Coatta, 560 Raymur Ave., Vancouver, British Columbia, Canada (V6A 3L2), and Charles Leslie Emery, R.R. No. 1, Roseneath, Ontario, Canada

Filed Aug. 4, 1975, Ser. No. 601,648
Int. Cl.² G02F *1/01*
U.S. Cl. 250—225 **32 Claims**



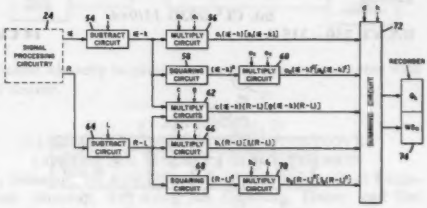
1. A photoelastic device adapted to measure stress on a structural member comprising:
a. a source of light adapted to produce a beam of plane polarized light, said source having a first polarization plane,
b. an analyzer plate transversely positioned in the path of the beam, the analyzer plate adapted to transmit light in a second polarization plane,
c. a transparent isotropic photoelastic plate positioned in the path of the beam between the light source and the analyzer plate, the photoelastic plate adapted to retard the beam of light in accordance with the occurrence of strain in the photoelastic plate,
d. a photocell adapted to receive the light transmitted by the analyzer plate and to produce an output signal which varies with the intensity of the light received, said light source, analyzer plate, photoelectric plate and photocell all being fixedly secured relative to the said structural member.
e. means adapted to transmit stress from the structural member to the photoelastic plate to thereby vary the retardation of the beam of light in accordance with the stress applied to the structural member, and
f. receiver means electrically connected to the photocell and adapted to receive the output signal from the photocell and calibrated to indicate the load on the structural member at at least one point over the range of the device.

3,971,935
TWO DETECTOR PULSED NEUTRON POROSITY AND WATER SALINITY APPARATUS AND METHODS

William B. Nelligan, Danbury, Conn., assignor to Schlumberger Technology Corporation, New York, N.Y.

Continuation of Ser. No. 356,151, May 1, 1973, abandoned. This application Nov. 4, 1974, Ser. No. 520,958
Int. Cl.² G01V *5/00*
U.S. Cl. 250—262 **52 Claims**

1. Apparatus for investigating a characteristic of an earth formation traversed by a borehole, comprising:
neutron source means for irradiating the formation with a pulse of neutrons;
first and second detector means spaced at different distances from the neutron source for generating signals in response to gamma radiation within the borehole following said neutron pulse;
first gating means for passing signals generated by the first detector means during (1) a first time interval following said neutral pulse in which the generated signals are representative of the neutron population in the formation opposite said first detector means and (2) a second time interval in which the generated signals are representative of background radiation at the first detector means;
second gating means for passing signals generated by the second detector means during (1) a first time interval in which the generated signals are representative of the neutron population in the formation opposite said second detector means and (2) a second time interval in which

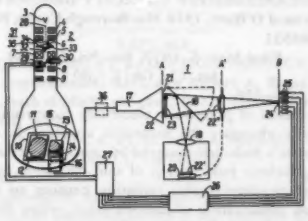


the generated signals are representative of background radiation at the second detector means;
means for combining the signals passed by the first gate means during the first and second time intervals thereof to provide a first background-corrected measurement of the neutron population in the formation;
means for combining the signals passed by the second gate means during the first and second time intervals thereof to provide a second background-corrected measurement of the neutron population in the formation; and
means for forming a function of the first and second background-corrected neutron population measurements as an indication of at least one of the porosity of the formation and the salinity of the formation fluid.

3,971,936
CORPUSCULAR BEAM MICROSCOPE, PARTICULARLY ELECTRON MICROSCOPE, WITH ADJUSTING MEANS FOR CHANGING THE POSITION OF THE OBJECT TO BE IMAGED OR THE IMAGE OF THE OBJECT

Walter Hoppe, Martinsried near Munich, Germany, assignor to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V., Gottingen, Germany

Filed Aug. 6, 1975, Ser. No. 602,461
Claims priority, application Germany, Aug. 27, 1974, 2441288
Int. Cl.² H01J *37/26*
U.S. Cl. 250—311 **12 Claims**



1. In a corpuscular beam microscope such as an electron microscope having adjusting means which result in a change in the object image, the improvement comprising:

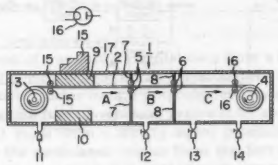
a. means for storing a reference object image;
b. means for deriving a convolution of the actual microscope image with said stored reference object image; and
c. means for evaluating said convolution to obtain an error signal to be used for setting said adjusting means.

3,971,937

RADIOGRAPHY APPARATUS FOR FORMING AN ELECTROSTATIC LATENT IMAGE OF A BODY TO BE EXAMINED BY THE IONIZATION OF GAS

Koichi Kinoshita, Narashino, Japan, assignor to Kinoshita Laboratory, Tokyo, Japan

Filed Nov. 13, 1974, Ser. No. 523,519
Claims priority, application Japan, Nov. 14, 1973, 48-128058
Int. Cl.² G03G *15/044*
U.S. Cl. 250—315 A **14 Claims**



1. A radiography apparatus for foming an electrostatic latent image of a body to be examined by the ionization of gas, comprising:
a first gas chamber having therein electrodes opposed in a predetermined spaced-apart relationship, the electric field produced by said electrodes being filled with ionizing gas at a predetermined pressure, an insulating film being disposed adjacent one of said electrodes;
a second gas chamber filled with gas, at a pressure which is substantially in equilibrium relationship with the pressure of the ionizing gas in said first gas chamber, said gas in said second chamber being less ionizable than said gas in said first gas chamber;
a film passage through which said insulating film moves between said first and said second chamber, said film passage providing a connection between said first and said second chamber in an air-tight manner with respect to the atmosphere; and
means for transporting said insulating film, said means locating said film in proximity to one of said electrodes in said first gas chamber and transporting said film through said film passage from one of said chambers to the other.

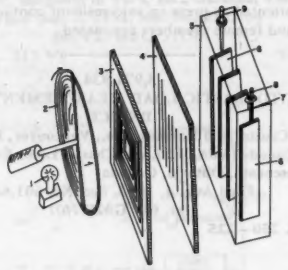
3,971,938

METHOD OF GENERATING ELECTRICITY FROM RADIANT ENERGY CALLED VARIABLE POLARIZABILITY CAPACITY GENERATOR

Louis Richard O'Hare, 1818 Marlborough Court, Fort Collins, Colo. 80521

Filed Mar. 5, 1973, Ser. No. 338,088
Int. Cl.² G01T *1/00*
U.S. Cl. 250—336 **9 Claims**

1. A method of generating electricity comprising:
periodically changing the dielectric constant in an electric condenser's dielectric material by causing a periodic change in the electron polarization of said dielectric by the influence of electromagnetic radiation causing an increase in electron polarization of the dielectric when this material absorbs radiation by means of intermittent interaction of said radiation with said dielectric,
employing said radiation absorbing dielectric as the dielectric material between electric condenser plates thereby effecting a variable condenser whose capacitance changes under the influence of radiation, admitting said radiation to and periodically interrupting it from said radiation variable condenser,
using the repeatedly changing capacitance of said variable condenser in a series electric circuitry with a transformer and a fixed condenser to produce a current flow in the



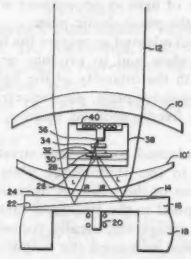
transformer's primary winding by the periodically elevated and then depressed voltage on the plates of the variable condenser as its capacitance changes under the influence of surges of electromagnetic radiation from period to period as this radiation is admitted or impeded respectively, and
to thereby transfer useful electric energy to an electric load by the transformer's secondary winding.

3,971,939

UNITARY LASSER/IR SEEKER

Clarence C. Andressen, Fredericksburg, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 19, 1975, Ser. No. 605,951
Int. Cl.² G01J *1/00*
U.S. Cl. 250—339 **14 Claims**



1. A combination infrared (IR) and laser (L) seeker comprising:
spectral filter means which is transmissive to IR energy and non-transmissive to L energy, said means having a front surface and a rear surface which slopes with respect to said front surface, the rear surface being coated to reflect IR energy and the front surface being reflective to L energy;
spinning gyroscope means on which said spectral filter means is mounted to spin therewith;
lens means forward of said filter means for focusing incoming IR and L energy, the energy emerging from the lens being converged on the front surface of said spectral filter means, L energy being reflected forward from the front surface and IR energy being reflected forward from the rear surface to a more forward focal point than the focal point of the L energy, the focused IR energy moving in a

circle around the focused L energy as the spectral filter means spins;

L-energy detection means on which the reflected L energy is focused;

IR-energy detection means; and

lens means in the path of said reflected IR energy for focusing it on said IR detection means.

3,971,940

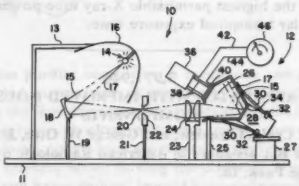
DETECTOR ABSORPTIVITY MEASURING METHOD AND APPARATUS

James C. Fletcher, Administrator of the National Aeronautics and Space Administraton, with respect to an invention of, and Ronald E. Sheets, Westminster, Calif.

Filed Mar. 19, 1975, Ser. No. 559,845

Int. Cl.² G01J *1/00*

U.S. Cl. 250—340 **10 Claims**



10. A method of measuring the absorptivity of a radiation detector which comprises:

providing a cavity radiometer which absorbs radiant energy and converts it into thermal energy, one inner surface of which is removable;

providing thermal measuring means which indicates the amount of radiant energy converted to thermal energy by said cavity radiometer;

supplying focused radiant energy to said cavity radiometer so that it impinges only on said removable inner surface whereby said thermal measuring means indicates the total amount of radiation incident upon said removable inner surface;

removing said removable inner surface and replacing it with a radiation detector which is to be measured for absorptivity;

supplying the exact amount of focused radiant energy as previously to said cavity radiometer, so that it impinges only on the active area of the radiation detector substituted for said removable inner surface, whereby said thermal measuring means indicates the amount of radiation reflected from the radiation detector and together with the measurement of total incident radiant energy furnishes sufficient information to determine the absorptivity of the radiation detector.

3,971,941

QUANTUM COUNTER WITH TEMPORAL DISCRIMINATION

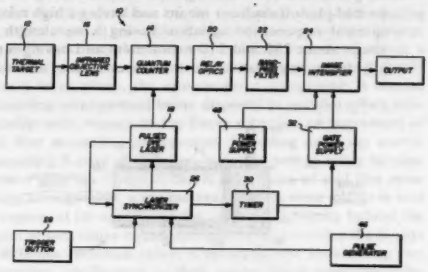
Kenneth G. Sewell, Dallas; James R. Herrington, Garland, and William B. Volz, Richardson, all of Tex., assignors to Varo, Inc., Garland, Tex.

Filed Feb. 12, 1975, Ser. No. 549,285

Int. Cl.² H01J *31/49*

U.S. Cl. 250—330 **7 Claims**

1. A direct viewing and imaging system comprising: a quantum mechanical substance arranged to receive target radiation and to fluoresce responsive thereto for developing an output with a predetermined lifetime; a source of pulsed pump radiation coupled to said quantum mechanical substance, said pump radiation having a predetermined pulse duration less than said lifetime; detector means optically coupled to the output of said quantum mechanical substance; and means for selectively decoupling said detector means and said quantum mechanical substance for the duration of a pulse of said pump



radiation whereby to eliminate "noise" signals associated with said source.

3,971,942

GAMMA-RAY CAMERA INCLUDING NOVEL CONVERTER MATRIX USEFUL THEREIN

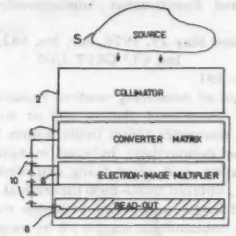
Ady Seidman, Tel Aviv; Zohar Avrahami, Ramat Gan; Benjamin Sheinfux, Tel Aviv; Jan Grinberg, Holon, and Uri Shimoni, Kiron, all of Israel, assignors to Ramot University Authority for Applied Research and Industrial Development Ltd., Tel Aviv, Israel

Filed Sept. 5, 1974, Ser. No. 503,284

Claims priority, application Israel, Sept. 5, 1973, 43166

Int. Cl.² G01T *1/20*

U.S. Cl. 250—363 S **19 Claims**



1. A gamma-ray camera characterized in that it includes a collimator receiving and collimating the gamma rays; a metal converter matrix converting the gamma rays to electrons; said metal converter matrix including a metal plate having a face formed with a plurality of spaced parallel surfaces extending substantially parallel to the direction the gamma rays exit from the collimator; an electron-image multiplier receiving the electrons and producing a multiplied electron output; and means for reading-out the output of the electron-image multiplier.

3,971,943

ULTRAVIOLET RADIATION MONITOR

Michel L. Jeunehomme, Novi, and Robert A. Essad, Sterling Heights, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Feb. 4, 1975, Ser. No. 546,855

Int. Cl.² G01J *1/42*

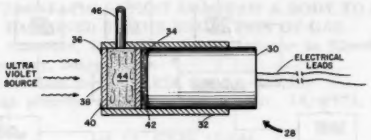
U.S. Cl. 250—372 **21 Claims**

1. An ultraviolet radiation transducer for generating an electrical output signal correlated to the intensity of ultraviolet radiation flux incident thereon, comprising:

phototransducer means for generating said electrical signal in response to the ultraviolet radiation flux incident thereon, said phototransducer means having a relatively

high spectral response in the range of 200 to 270 nanometers of radiation wavelength;

first optical means for filtering ultraviolet radiation incident on said phototransducer means and having a high relative spectral response to radiation having a wavelength between about 200 and 270 nanometers and having a rapidly decreasing relative spectral response from about 270



nanometers to about 330 nanometers wavelength of radiation; and,

second optical means for filtering ultraviolet radiation incident on said phototransducer means and having a relative spectral response which is comparatively low for radiation having a wavelength of 200 nanometers, the relative spectral response rapidly increasing as the radiation wavelength increases.

3,971,944

NEUTRON DOSIMETRY

Thomas C. Quinby, Kingston, Tenn., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed May 29, 1975, Ser. No. 582,057
Int. Cl.² G01T 3/00
U.S. Cl. 250—391 **5 Claims**

1. A method of measuring neutron radiation within a nuclear reactor comprising placing one or more oxide wires comprising a dosimeter target oxide within the reactor and measuring the radioactivity induced in said wires by said neutron radiation, said wires being extruded from an oxide extrusion mix, sintered to 40–60% theoretical density, and cut to the desired length, said oxide extrusion mix comprises an oxide dilution containing at least 0.1% by weight of the dosimeter target oxide in a diluent oxide.

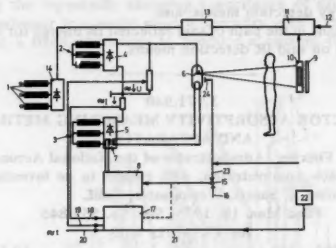
3,971,945

X-RAY DIAGNOSTIC APPARATUS FOR USE WITH AN X-RAY PHOTOGRAPHING DEVICE PROVIDING FOR A PRE-SET X-RAY EXPOSURE TIME

Kurt Franke, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Apr. 26, 1974, Ser. No. 464,654
Claims priority, application Germany, June 4, 1973, 2328322
Int. Cl.² H05G 1/30
U.S. Cl. 250—402 **4 Claims**

1. In an X-ray diagnostic apparatus for the operation of an X-ray photographing device requiring a fixedly preset exposure time for X-ray image; a control circuit for the X-ray dosage power with reference to a patient, said control circuit including dosage output measuring means, comparator means connected to said measuring means adapted to compare the actual value of the dosage output with a reference value, said control circuit effecting an optimum film darkening for a particular exposure time, and setting means for the voltage of an X-ray tube in said apparatus controlled by an output of said comparator means for correlating the actual value of said dosage power with the reference value, the improvement comprising means in said control circuit for determining and adjusting the X-ray tube current so as to always automatically



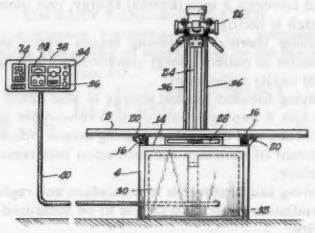
generate the highest permissible X-ray tube power output for a particular transpired exposure time.

3,971,946

X-RAY APPARATUS WITH IMPROVED HOUSING FOR COMPONENTS

James R. Craig, Glenview, and George W. Otto, Jr., Elmhurst, both of Ill., assignors to American Radiologic Systems Inc., Melrose Park, Ill.

Filed Dec. 12, 1974, Ser. No. 532,013
Int. Cl.² H05G 1/10
U.S. Cl. 250—422 **8 Claims**



1. X-ray apparatus comprising a pedestal, a table on said pedestal and movable thereon, a tube stand mounted for movement longitudinally of said table and carrying and X-ray tube, a bucky grid and X-ray film carrier below the table and movable with the tube stand, X-ray power unit and control means both housed within the pedestal so as to underlie the table; said power unit having components including a high voltage transformer having a primary winding and a secondary winding for providing operating voltage in the order of kilovoltage to said X-ray tube, said control means having components including an additional transformer providing a supply voltage for said primary winding, and said control means further having switch means for opening and closing a circuit from said additional transformer to said primary winding; means forming a conductive connection between components of the power unit and components of the control means, a control unit remote from said pedestal and having means including timer circuitry for initiating a cycle of operation that includes the closing and opening of said switch means, thereby to produce an X-ray exposure, said switch means and a part of said timer circuitry being in the housing in which said additional transformer is located, and an electrical cable connecting said control unit to said control means, the voltage in said cable and across components in said control unit being not in excess of about 30 volts.

3,971,947

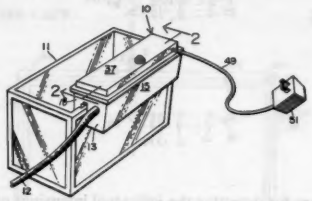
ULTRAVIOLET WATER PURIFIER

Douglas N. Lambert, 9451 Haitian Drive, Miami, Fla. 33157, and Richard H. Bennett, 8731 SW. 125th St., Miami, Fla. 33156

Filed Dec. 19, 1974, Ser. No. 534,627

Int. Cl.² G01N *21/24, 21/26;* A01K *63/00;* A61L *3/00*

U.S. Cl. 250—437 4 Claims



1. A water purifier comprising a receptacle comprising an inlet mounted at one side of said receptacle, outlet means compelling the flow of water along substantially the full length of said receptacle, an ultraviolet lamp, means mounting said ultraviolet lamp above said water and extending along said receptacle whereby water flowing therethrough is exposed to ultraviolet rays being emitted by said lamp, a depending baffle mounted adjacent said inlet in said receptacle and terminating in spaced relation to a bottom wall of said receptacle forming an opening and compelling water entering said receptacle to flow downwardly and be discharged through said opening, filtering means mounted in said receptacle adjacent to said depending baffle, a second depending baffle mounted adjacent to said filtering means and extending to below the surface of water positioned in said receptacle thereby forming a chamber above said filtering means for trapping bubbles entering said receptacle.

3,971,948

X-RAY DIAGNOSTIC APPARATUS FOR PRODUCING A TRANSVERSE LAYER IMAGE

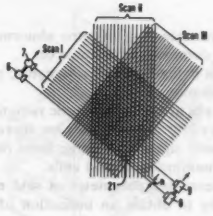
Manfred Pfeiler, Erlangen, and Gerhard Linke, Erlangen-Frauenaurach, both of Germany, assignors to Siemens Aktiengesellschaft, Erlangen, Germany

Filed Aug. 2, 1974, Ser. No. 494,272

Claims priority, application Germany, Aug. 6, 1973, 2339758

Int. Cl.² G01M *23/00*

U.S. Cl. 250—445 T 3 Claims



1. In an X-ray diagnostic apparatus for producing a transverse-layer image; including a first X-ray measuring arrangement having an X-ray source generating an X-ray of a transverse diffusion perpendicular to the layer being equal to the layer thickness and parallel to the layer being equal to or lesser than the layer thickness, a first radiation receiver means in said arrangement for measuring the radiation intensity behind an object at successive equidistant points, and drive means for said measuring arrangement for effecting a linear scanning movement across the entire object expanse perpendicular to the direction of the central X-ray in alternating sequence at small equidistant angular increments over a range of 180°, said angular increments being measured about a rotational point on said central X-ray approximately centrally of said layer plane, the improvement comprising; a second measuring arrangement being disposed in parallel offset relationship with respect to the linear direction of movement of said first measuring arrangement including an X-ray source generating X-rays of different radiation energy value in comparison with the x-rays of the X-ray source of said first measuring arrangement, a second radiation receiver means in said arrangement for measuring the radiation intensity behind the object at successive equidistant points for receiving the X-rays of different radiation value; a calculator for formulating two absorption coefficients or their proportional magnitudes for each image point in dependence upon the measured signals of said first and second measuring arrangements for the two different values of the radiation energy, said calculator being adapted to form respective quotients and through stored calibrating tables provide the median ordinate value or corresponding parameter for each image point.

3,971,949

OPERATIVE LOCATION FOR THE EXAMINATION OF PATIENTS BY MEANS OF X-RAYS

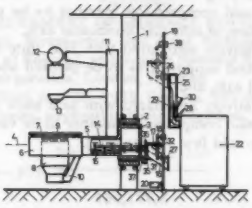
Wolfgang Bräther, and Alfred Hahn, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Erlangen, Germany

Filed Oct. 9, 1974, Ser. No. 513,493

Claims priority, application Germany, Oct. 13, 1973, 2351542

Int. Cl.² G01M *23/00*

U.S. Cl. 250—446 10 Claims



9. In an operative location for the examination of patients by X-rays, including a patients' support bed tiltable about a horizontal, vertically adjustable pivoting axis; an X-ray exposure installation having a picture plane extending in parallel with said patients' support bed; an overhead X-ray tube oriented towards said picture plane, and an automatic developing arrangement for X-ray film sheets, the improvement comprising: conveying means for the exposed X-ray film sheets compensating for the elevational adjustability and inclinability of said X-ray exposure installation being disposed intermediate said picture plane and said automatic developing arrangement, said developing arrangement being immovably positioned on the floor of said location; a light-tight covered chute having a U-shaped feed hopper being located below said pivoting axis and leading towards said automatic developing arrangement; a plurality of nozzles being locaated in the walls of said chute and of said feed hopper; and means for supplying pressurized air to said nozzles.

3,971,950

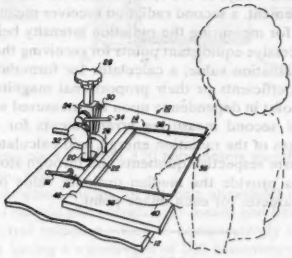
INDEPENDENT COMPRESSION AND POSITIONING DEVICE FOR USE IN MAMMOGRAPHY

David T. Evans, Manhattan Beach; Ellen M. Proctor, Pasadena; Frank R. Brion, Arcadia, and Theodorus M. Ceelen, La Verne, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 14, 1975, Ser. No. 567,797

Int. Cl.² G21K *5/08*; G01N *21/00*, *23/00*; A61G *13/00*

U.S. Cl. 250—451 15 Claims



1. Apparatus for compressing and positioning an object to be examined by subjecting the object to penetrating radiation comprising:

a base member,

a member supported by said base member and extending along a first vertical axis,

a slide assembly mounted to said vertically extending member and adapted for movement therealong,

a compression member extending along a first horizontal axis and mounted to said slide assembly via a support member,

means operatively associated with said slide assembly for enabling said compression member to be positioned in the direction of said first horizontal axis,

means operatively associated with said slide assembly for enabling said support arm to be pivoted about said first horizontal axis, and

means operatively associated with said slide assembly for enabling said compression member to be vertically tilted relative to said first vertical axis.

3,971,951

APPARATUS FOR MEASURING TWO DIFFERENT FLUORESCENCES OF A SAMPLE

Katsuji Rikukawa, Tokyo, and Kenji Onogi, Chigasaki, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

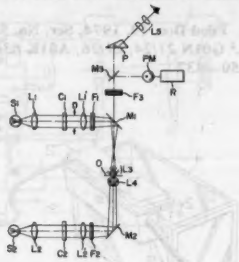
Filed Oct. 10, 1974, Ser. No. 513,869

Claims priority, application Japan, Oct. 17, 1973, 48-115687

Int. Cl.² G01J *1/58*

U.S. Cl. 250—458 9 Claims

1. Fluorometric apparatus for measuring two different fluoroscences of a sample, the apparatus comprising a first illumination optical system for irradiating the sample with a first excitation light modulated at a first frequency and having a first wavelength, the first excitation light being reflected to the sample and the sample emitting a first fluorescent light, a second illumination optical system for irradiating the sample with a second excitation light modulated at a second frequency and having a second wavelength, the second excitation light being transmitted through the sample and the sample emitting a second fluorescent light, filter means for the passage therethrough of the first and second fluorescent lights emitted by the sample and for preventing said excitation lights from passing therethrough, and detecting means responsive to said first and second fluorescent lights passed through said



filter means for detecting the individual intensities of the first and second fluorescent lights.

3,971,952

METHOD OF DETECTING ABNORMAL BEHAVIOR OF MAMMALIAN CELLS

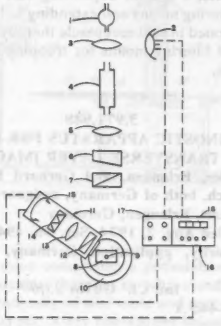
Michael Inbar, and Meir Shinitzky, both of Rehovoth, Israel, assignors to Yeda Research & Development Co. Ltd., Rehovoth, Israel

Filed Sept. 12, 1974, Ser. No. 505,530

Claims priority, application Israel, Sept. 14, 1973, 43224

Int. Cl.² G01N *21/38*

U.S. Cl. 250—461 B 8 Claims



1. A method of detecting in vitro abnormal behavior of mammalian cells comprising the steps of:

isolating from a living body of a mammal, cells which it is desired to examine,

exposing said cells to electromagnetic radiation in the range of from about 200 to about 700 nm thereby to cause an electromagnetic signal to emerge from the lipid layer of the surface membrane of said cells,

measuring at least one parameter of said electromagnetic signal thereby to obtain an indication of the fluidity of said lipid layer,

comparing said indication obtained in the measuring step with a corresponding indication obtained from normal cells of the same type,

thereby to determine whether or not the fluidity of said lipid layer of said mammalian cells tested significantly differs from the corresponding value of said normal cells of the same type, a difference indicating abnormal behavior of said mammalian cells tested.

3,971,953

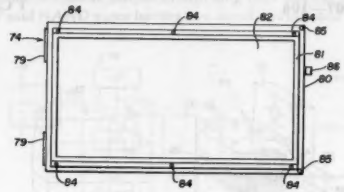
X-RAY TABLE

Cecil K. Bridgeman, Islington, Canada, assignor to Picker X-Ray Mfg. Limited, Ontario, Canada

Division of Ser. No. 320,142, Jan. 2, 1973, Pat. No. 3,891,850, which is a continuation of Ser. No. 93,268, Nov. 27, 1970, abandoned, which is a continuation-in-part of Ser. No. 777,943, Oct. 4, 1968, abandoned, which is a continuation-in-part of Ser. No. 657,121, July 31, 1967, abandoned. This application Nov. 27, 1974, Ser. No. 527,750

Int. Cl.² G11B 1/00

U.S. Cl. 250—469 21 Claims



1. In an X-ray device, a radiographic exposure station assembly comprising:

a. a pair of intensifying screens defining an exposure station therebetween and each having a surface for engaging a piece of radiographic film positioned in the station;

b. screen positioning mechanism connected to the screens and adapted to move the screens relatively from a film engaging exposure position to a spaced film handling position, the film handling position permitting film to be inserted into and removed from the exposure station; and,

c. evacuating means for evacuating the exposure station while ambient air pressure external of the station is substantially unaffected whereby the ambient air pressure will force the screen surfaces into tight intimate engagement with a piece of film positioned in the exposure station when the station is evacuated.

3,971,954

ULTRAVIOLET CAMERA SYSTEM FOR DENTAL PHOTOGRAPHY AND MOUTHPIECES THEREFOR

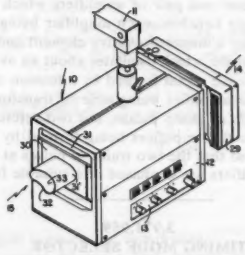
Israel Kleinberg, Smithtown, N.Y.; Alex Domokos, Winnipeg, Canada, and Cosmo Castaldi, West Hartford, Conn., assignors to Alphametrics Ltd., Winnipeg, Canada

Filed Nov. 11, 1974, Ser. No. 522,983

Claims priority, application United Kingdom, Nov. 12, 1973, 52440/73

Int. Cl.² G03B 41/16

U.S. Cl. 250—475 12 Claims



1. A system for photographing the surfaces of the teeth and adjacent soft tissues, within the mouth of a patient, in conjunction with a camera and comprising in combination a hollow mouthpiece assembly detachably engageable within the said mouth of the patient, a source of ultraviolet light operatively connected to said mouthpiece whereby said ultraviolet light illuminates said teeth, and means to operatively connect said mouthpiece to the associated camera, the wave length of said ultraviolet light being between 200 and 380 nanometers.

3,971,955

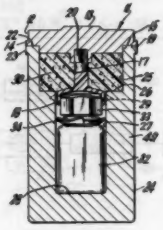
SHIELDING CONTAINER

Robert E. Heyer, Hopatcong, and Bernard J. Bolter, Trenton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Aug. 14, 1975, Ser. No. 604,752

Int. Cl.² G21F 5/00

U.S. Cl. 250—507 10 Claims



1. A shielding container for radiopharmaceuticals comprising a cover and a cylindrical body wherein said cover includes a disk shaped lid having a depending member and cap cover, said cylindrical body is formed with a squared off well and an outer recess communicating with said well, a sealed bottle containing radiopharmaceutical material having a retaining ring located around its neck is located in said well, said cap cover contacting the bottle cap, and a pad of absorbent, flexible, resilient material located around said depending member and filling said outer recess.

3,971,956

MEASUREMENT OF SURFACE ROUGHNESS

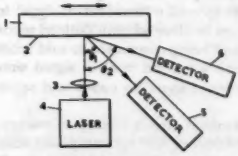
Eric Jakeman, Birtsmorton, and Peter Nicholas Pusey, Malvern, both of England, assignors to National Research Development Corporation, London, England

Filed Jan. 20, 1975, Ser. No. 542,406

Claims priority, application United Kingdom, Jan. 21, 1974, 2765/74

Int. Cl.² G01N 21/30

U.S. Cl. 250—571 8 Claims



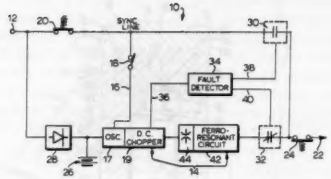
1. A method of measuring surface roughness comprising the steps of directing a beam of electromagnetic radiation onto a portion of a surface to be measured, applying relative movement between the surface and the beam in a direction having a component normal to the beam, detecting average intensity and average of the square of intensity of radiation scattered at at least one angle from the surface, and processing the detected radiation to determine height of irregularities of the surface.

3,971,957

ELECTRICAL LOAD TRANSFER CONTROL SYSTEM

Alfred Max Hase, 6 Manorwood Road, Scarborough, Ontario, Canada

Filed May 30, 1975, Ser. No. 582,200
Int. Cl.[2] H02J 9/00
U.S. Cl. 307—64 9 Claims



1. For use in an electrical power system having two power sources, where the first power source is an ordinarily available aternating current source and the second power source is an inverter having an output synchronized to said first power source, and where the load is an alternating current load which is normally connected to the output of said second power source; a control system for providing an essentially uninterrupted power flow to said load in the event of failure of said second power source by transferring said load to said first power source, and for isolating said second power source from said first power source when said first power source is connected to said load, comprising:

first controllable and normally open switch means having a first operating period to close, and being connected to said first power source and to said load;

second controllable and normally closed switch means having a second operating period to open, and being connected to said second power source and to said load;

each of said first and second switches being such that the respective power source is both current and voltage isolated from said load when that switch is open;

fault sensing means connected to said second power source for sensing any fault therein while said second power source is connected through said second switch means to said load; said fault sensing means being connected to said first switch means so as to emit a first control signal to cause said first switch means to close when a fault in second power source is sensed, and being connected to said second switch means so as to emit a second control signal simultaneously with said first control signal to cause said second switch means to open;

and a ferroresonant circuit having an energy storage element connected between said second power source and said load so as to be connected to said load even after any failure of said second power source for at least the length of time of said second operating period;

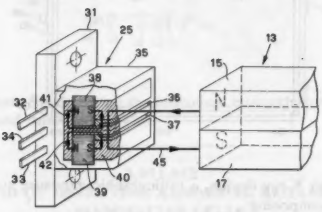
said first operating period being shorter than said second operating period so that said first switch means is closed before said second switch means is opened after a fault in said second power system has been sensed; said energy storage element having at least sufficient energy storage capacity substantially to provide the energy requirement of said load for the length of time of said first operating period plus the operating period of said fault sensing means.

3,971,958

PULSE GENERATOR FOR PROVIDING INFORMATION AS TO THE RATE OF ROTATION AND PHASING OF AN ENGINE TO AN ELECTRONIC APPARATUS INTENDED TO GOVERN THE FUEL FEED TO AN INTERNAL COMBUSTION ENGINE OF THE FUEL INJECTION TYPE

Edoardo Rogora, and Walter Giraudi, both of Milan, Italy, assignors to Alfa Romeo S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 387,637, Aug. 13, 1973, abandoned, which is a continuation of Ser. No. 225,228, Feb. 10, 1972. This application Mar. 26, 1974, Ser. No. 454,937
Claims priority, application Italy, Feb. 20, 1974, 48585/74
Int. Cl.[2] H03K 3/00
U.S. Cl. 307—106 1 Claim



1. A pulse generator for providing information as to the speed of rotation and phase angle of an engine to an electronic apparatus for regulating the fuel feed to an internal combustion engine of the injection type, having a plurality of cylinders, comprising: a number of magnetosensitive switching devices formed by a number of magnetoresistive elements equal to the half of the number of the cylinders of the engine, said magnetoresistive elements being of differential tripolar type, formed by two magnetoresistors and by two permanent magnets, each of which is able to affect one magnetoresistor, means for producing a magnetic field for switching said magnetosensitive switching device mechanically connected to the main shaft so as to be rotated at a speed which is proportional to that of the mainshaft and with a preselected phase relationship with respect to said mainshaft, said field producing means being formed by two permanent magnets with pole pieces of suitable angular extension being arranged so as to have opposite magnetic polarities juxtaposed, said magnetic field periodically affecting said switching devices and causing their temporary switching with a duration and a frequency which are a function of the speed of rotation of the engine shaft and with a phase relationship which is a function of the phase relationship aforementioned, a circuit connected to said magnetoresistive elements for processing the signals delivered by said differential magnetoresistive elements, said circuit comprising at least one pair of amplifiers which operate as tension comparing switches, each amplifier being fed with a signal delivered by a magnetoresistive element and formed by an alternative tension which oscillates about an average value and with a reference signal formed by a tension of predetermined value, the amplifier being able to transform the first signal into a train of sharp pulses, the two reference signals which are fed to the amplifiers being formed by tensions of different values so that the two trains of pulses at the outputs of the two amplifiers are dephased of a suitable fixed angle.

3,971,959

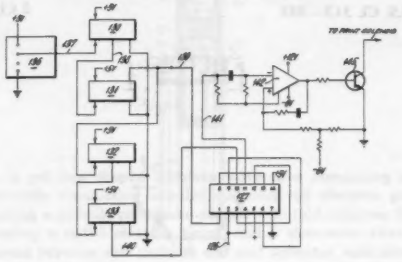
TIMING MODE SELECTOR

Norman Eustace Flournoy, Richmond, Va., assignor to Texaco Inc., New York, N.Y.

Filed Nov. 24, 1972, Ser. No. 309,392
Int. Cl.[2] H03K 21/32, 21/36
U.S. Cl. 307—225 R 1 Claim

1. Timing mode selector comprising in combination

a clock pulse generator for supplying a continuous series of timing pulses,
a first pair of integrated-circuit counters,
said counters being connected in series to the output of said generator for providing a predetermined first mode pulse rate output,
a second pair of integrated-circuit counters,
said second counters being connected in series to said first mode output for providing a predetermined second mode pulse rate output,
a unitary integrated circuit for alternatively selecting said first or second mode output comprising four NAND gates, each of said NAND gates having two input circuits and an output,



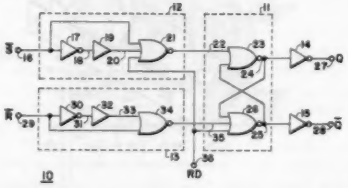
means for connecting a mode-control signal to said unitary integrated circuit,
said mode-control signal having an on-state for one of said modes and an off-state for the other of said modes,
an output circuit from said unitary integrated circuit for transmitting the selected one of said modes,
first circuit means for connecting said first and second mode pulse rate outputs to the inputs of two of said NAND gates,
second circuit means for connecting said mode-control signal connecting means to two other inputs of said NAND gates, and
third circuit means for connecting said output circuit to one of said NAND gate outputs.

3,971,960

FLIP-FLOP FALSE OUTPUT REJECTION CIRCUIT

Rodney J. Means, and Gene A. Schriber, both of Tempe, Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed Mar. 5, 1975, Ser. No. 555,470
Int. Cl. H03K *3/286, 3/353*
U.S. Cl. 328—206 **7 Claims**



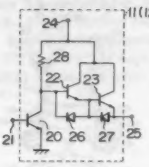
1. A digital logic circuit comprising:
a. storage means having a first storage state and a second storage state for storing digital information;
b. first input means coupled to said storage means and adapted to respond to a first input signal for causing said storage means to assume said first storage stage;
c. second input means coupled to said storage means and adapted to respond to a second input signal for causing said storage means to assume said second storage state; and
d. false output rejection circuit means coupled to the output of said storage means for generating a corrected replica of said first storage state when time asynchronism between said first input signal and said second input signal cause said storage means to assume a logically indeterminate state.

3,971,961

PULSE AMPLIFIER

Mamoru Inami; Yoshiaki Tanaka, and Tsuyoshi Ono, all of Yokohama, Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Filed Dec. 26, 1974, Ser. No. 536,653
Claims priority, application Japan, Dec. 28, 1973, 49-2750; Feb. 15, 1974, 49-18162
Int. Cl.² H03K *3/26, 5/08, 19/36*
U.S. Cl. 307—268 **11 Claims**



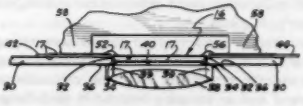
1. A pulse amplifier for producing sharp pulses of high amplitude, comprising, in combination, input and output terminals, a first transistor connected to said input terminal and arranged to change its on-off states in accordance with the presence and absence of input pulses applied to said input terminal, a second transistor having its base connected to the collector of said first transistor, a third transistor having its base connected to the emitter of said second transistor and having its collector connected in common with the collector of said second transistor to a power supply and having its emitter connected to said output terminal, so that said second and third transistors change their on-off states in alternate relationship with said first transistor, first circuit means connecting the base of said third transistor to the base of said second transistor for applying the potential at the base of said second transistor instantaneously to the base of said third transistor, and second circuit means connecting the output terminal to the collector of said first transistor to receive current from an external circuitry when said second transistor is non-conducting.

3,971,962

LINEAR TRANSDUCER ARRAY FOR ULTRASONIC IMAGE CONVERSION

Philip S. Green, Redwood City, Calif., assignor to Stanford Research Institute, Menlo Park, Calif.

Filed Sept. 21, 1972, Ser. No. 291,002
Int. Cl.² H01L *41/08*
U.S. Cl. 310—8.1 **13 Claims**



1. An ultrasonic transducer for converting a portion of a focused compressional acoustic image field of an area to be viewed to electric impulses representative of the incident focused compressional image field and which are used to produce a detailed image of the said area, including an array of piezoelectric elements arranged in a single curved line, said curve being defined by the configuration of the said focused compressional acoustic image field to be converted, whereby said array of piezoelectric elements converts a single line

across said focused compressional acoustic image field to electric impulses.

3,971,963

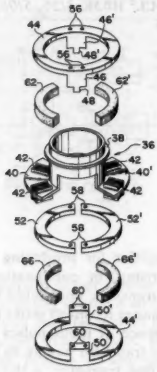
ELECTOMAGNETIC ROTARY MOTION DEVICE AND EXPOSURE CONTROL DEVICE USING THE SAME

Hiroshi Koike, No. 5-10, 1-chome, Minami-Azabu, Minato, Tokyo; Shoji Suzuki, No. 11-4-208, 4-chome, Minami-Dai, Sagamihara, Kanagawa, and Takeki Asakawa, No. 3-2, 2-chome, Minami-Azabu, Minato, Tokyo, all of Japan

Filed Sept. 11, 1973, Ser. No. 396,207

Int. Cl.[2] H02K 21/26

U.S. Cl. 310—154 7 Claims



1. An electromagnetic rotary motion device which comprises, in combination:

A. a stator unit, as a stationary magnetic flux generating means, having an axis therethrough and comprising:

1. first and second annular outer pole pieces, disposed so as to be axially spaced apart and mutually parallel, which have identical radii of curvature and inner pole surfaces in axially opposed relationship,

2 first and second semi-circular permanent magnets, having outer magnet surfaces which are attached to said inner pole surfaces, first and second inner magnet surfaces which are axially spaced apart in opposed relationship, and said identical radii of curvature,

3 an intermediate pole piece which is disposed approximately between and in parallel to said first and second permanent magnets, is spaced sufficiently far apart from said inner magnet surfaces to form first and second air gaps therebetween so that a magnetic field is established across said air gaps and like field poles appear at said inner magnet surfaces and opposite like field poles appear at said outer magnet surfaces, in said first and second outer pole pieces, and in said intermediate pole piece;

B. a rotor unit, as an armature means comprising:

1 a bored non-magnetic cylinder having a flange extending radially outwardly from the circumferential edge thereof and an opening formed in said flange, and

2. an armature mounted on said flange within said opening and having the coil thereof wound so that portions extend axially and radially to define arcuately disposed opening which is located on one side of said flange;

C. a non-magnetic rigid mounting means for said stator unit; and

D. a rotatable mounting means for said rotor unit whereby said rotor unit is rotatably mounted with said axis as the axis for said cylinder and said intermediate pole piece is disposed within said arcuately disposed opening without contacting said coils throughout the range of rotation of said rotor unit.

3,971,964

CYLINDRIC GRID ELECTRODE STRUCTURE FOR ELECTRONIC TUBES COMPRISING CARBON FILAMENTS COATED WITH PYROLYTIC GRAPHITE

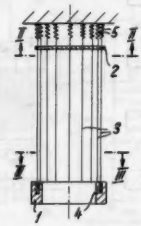
Julius Slosiar, Chavannes-pres-Renens, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Oct. 21, 1974, Ser. No. 516,761

Claims priority, application Switzerland, Nov. 7, 1973, 15649/73

Int. Cl.[2] H01J 1/48, 19/42

U.S. Cl. 313—355 2 Claims



1. A grid electrode structure for electronic transmitter tubes characterized by the fact that the portion thereof which constitutes the grid proper consists of carbon in thread or filamentary form which is completely covered by a layer of pyrolytic graphite.

3,971,965

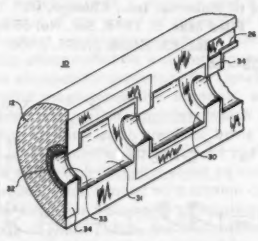
INTERNALLY-FOCUSED TRAVELING WAVE TUBE

Halsted W. Baker, Forked River, and Arthur H. Gottfried, Rumson, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 31, 1975, Ser. No. 563,546

Int. Cl.[2] H01J 25/34

U.S. Cl. 315—3.5 8 Claims



1. In a traveling-wave type electron tube the improvement comprising:

an elongated housing having a central evacuated passageway therethrough;

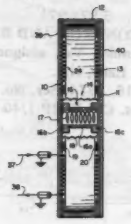
a plurality of annular magnets, concentric with said central evacuated passageway, supported within said housing at predetermined spaced locations along the length of said passageway; and

circuit means supported within said housing having annular portions concentric with and coincident with said magnets.

3,971,966
PLANAR RING BAR TRAVELLING WAVE TUBE

Arthur H. Gottfried, Rumson; Louis J. Jasper, Jr., and John J. Tancredi, both of Neptune, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 14, 1975, Ser. No. 604,737
Int. Cl.² H01J 25/34
U.S. Cl. 315—39.3 10 Claims

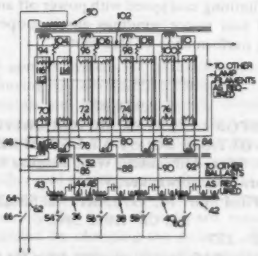


1. A pill box shaped traveling wave tube comprising an electrically conductive annular collector, an electron gun including a cathode positioned coaxial with said collector for providing a radial electron beam, and a slow-wave circuit disposed between said cathode and said collector, said slow-wave circuit being a ring-bar structure having a plurality of closed concentric coplanar rings of differing radii coaxial with said cathode and said collector and positioned adjacent at least one of two transverse boundaries of said radial beam, said slow-wave circuit further including a plurality of radially disposed electrically conductive bars, adjacent ones of said rings being connected only by a single one of said radial bars, and successive bars being angularly disposed relative to one another.

3,971,967
FLUORESCENT LAMP INSTALLATION HAVING SEPARATE FILAMENT TRANSFORMERS AND REMOTELY LOCATED BALLAST

Henry H. Hawkins, West Vancouver, Canada, assignor to H. H. Hawkins Ltd., W. Vancouver, Canada

Filed Jan. 16, 1975, Ser. No. 541,685
Claims priority, application Canada, May 17, 1974, 200238
Int. Cl.² F21V 21/14; H05B 41/14
U.S. Cl. 315—97 10 Claims

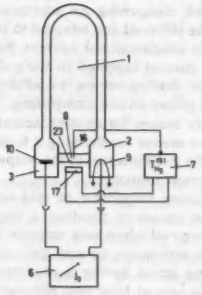


1. A fluorescent lamp installation comprising:
- a plurality of pairs of discharge lamps each lamp having a pair of filaments;
- a plurality of current limiting ballasts located remote from said lamps;
- means for connecting one side of each ballast to a source of supply;
- means connecting the other side of each ballast to one filament of one of a pair of lamps with no more than one lead per pair of lamps;
- means for connecting the other side of said supply to one filament of the other lamp of said pair;
- means to supply current to the filaments of each pair of lamps so that the other filaments of said one and said other lamp in the pair are connected together and said one filament of each lamp in the pair are isolated from each other, wherein said lamp filament current supply means is mounted close to said lamps.

3,971,968
ULTRAVIOLET RADIATION SOURCE INCLUDING TEMPERATURE CONTROL AND PRESSURE CONTROL OPERATING MEANS

Robert Bachmann, Dottingen; Pieter Bearda, Turgi; Walter Stoidl, Gebenstorf; Gerold Brandli, Aarau, and Rudolf Rieder, Wettingen, all of Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Feb. 20, 1975, Ser. No. 551,425
Claims priority, application Switzerland, Mar. 4, 1974, 2994/74; June 20, 1973, 8456/74; Sept. 18, 1974, 12672/74
Int. Cl.² H01J 61/067, 61/30; H05B 41/36
U.S. Cl. 315—108 30 Claims



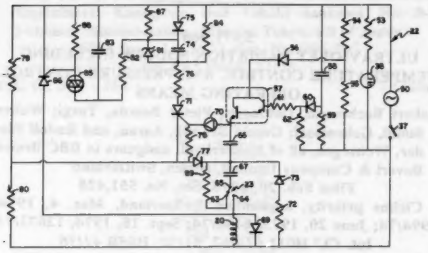
1. Apparatus for generating ultraviolet radiation of high spectral radiance whereby the radiation is produced in a discharge tube having a thermoemissive cathode and a discharge space and filled with mercury/argon by means of a wall-stabilized direct-current gas discharge at a mercury pressure P_{Hg} of between 5×10^{-1} Torr and a current density j of the discharge current I of between 1 and 25A/cm², comprising;
- a discharge tube having a discharge space, a cathode space, and an anode space, and incorporating a pressure-equalizing space connecting the cathode space to the anode space so that the sum of the volume of the cathode space, anode space and pressure-equalizing space is greater than the volume of the discharge space,
- the pressure of the argon being between 0.01 and 10 Torr,
- first control means for regulating the current density j of the discharge current I to a constant value j_o between I and 25A/cm², and,
- second control means for regulating the pressure p_{Hg} of the mercury to such a value that the yield η of the line of wavelength 2537A, i.e. the ratio of the spectral radiation power for the wavelength $\lambda = 2537A$ to the electrical power stored in the discharge, is at least 80% of the maximum yield η_{max} for the chosen current density j_o.

3,971,969

ELECTRICALLY OPERATED STAPLING DEVICE

Harry T. Wines, Flushing; John J. Power, Westbury, and Gilbert Knauer, Oceanside, all of N.Y., assignors to Swingline, Inc., Long Island City, N.Y.

Filed Oct. 2, 1974, Ser. No. 511,254
Int. Cl.[2] H01H 47/32
U.S. Cl. 317—148.5 B 11 Claims



1. In an electrically powered stapling device comprising driving means for driving a staple and a solenoid having a solenoid coil and a solenoid armature interconnected with and adapted to move said driving means in a staple-driving direction when electric current is passed through the coil, the improvement comprising an electronic pulser circuit connected to the solenoid and adapted to supply the solenoid with at least two unidirectional current pulses from a source of alternating current supplied to the pulser circuit, said pulses causing said driving means to advance and drive a single staple, said pulser circuit comprising:

a. actuator means for causing actuation of the stapler;

b. window means for defining a beginning time and an end time of a fixed interval in the output cycle of said alternating current source;

c. gate means responsive to said actuator means and said window means to produce a trigger signal during said fixed interval when said actuator means is actuated;

d. means responsive to said gate means for producing an enabling signal having a predetermined duration which extends into at least two alternate half-cycles from said source of alternating current; and

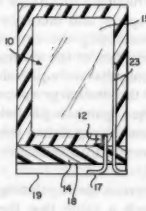
e. control means responsive to said enabling signal for passing to said solenoid coil at least two alternate half-cycles from said alternating current source.

3,971,970

ELECTRICAL COMPONENT WITH LOW IMPEDANCE AT HIGH FREQUENCY

Gerald A. Voyles, and Edward M. Moss, both of Indianapolis, Ind., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Nov. 27, 1974, Ser. No. 527,606
Int. Cl.[2] H01G 9/05
U.S. Cl. 317—230 10 Claims



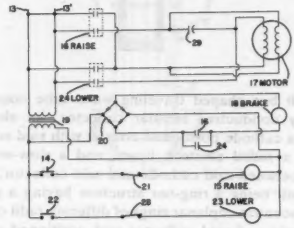
1. An electrical component having low impedance at high frequency input signals comprising a dielectric oxide film-forming metal anode with an anode lead projecting from the anode, electrolyte contacting surfaces of the anode to form a body, surfaces of the body at an angle with respect to each other, and a cathode lead contacting the body, the cathode lead including an elongated cathode strip having at least two major surfaces, one of the major surfaces bonded to at least one of the surfaces of the body, the anode lead and the cathode strip spaced a short distance from each other and each projecting from the body a relatively short distance in a spaced, substantially parallel relationship.

3,971,971

ELECTRIC HOIST CONTROL AND BRAKING SYSTEM

David C. Wycoff, Roanoke, Va., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Nov. 15, 1974, Ser. No. 524,081
Int. Cl.[2] H02P 1/40
U.S. Cl. 318—203 A 9 Claims



1. A braking apparatus for electric motors subject to overhauling loads comprising:

an alternating current power source;

an electric alternating current motor having a normal operating speed;

a control system for starting, stopping, and controlling the direction and limit of travel of said motor; and

a fixed capacitor permanently connected to at least one of the motor windings such that at any time power is removed from said motor, said capacitor being selected in cooperation with the residual magnetic field of the motor stator windings and their associated impedance characteristics to effect a resonant condition causing said motor to become self-excited and to develop braking torque upon continued rotation of said motor above a speed substantially below normal operating speed for the purpose of limiting said speed with power off and said capacitor and said motor windings alone cooperate to effect running performance of said motor.

3,971,972

TRANSISTOR INVERTER MOTOR DRIVE HAVING VOLTAGE BOOST AT LOW SPEEDS

Frederick A. Stich, Milwaukee, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Mar. 14, 1975, Ser. No. 558,294
Int. Cl.[2] H02P 5/40
U.S. Cl. 318—227 32 Claims

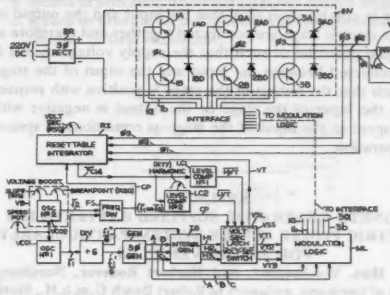
1. In a three-phase bridge inverter drive for supplying variable frequency and variable magnitude voltage to an electric motor,

integrator means for deriving constant volt/hertz pulses whose frequency is a function of an analog speed signal and which vary in width as a function of the time integral of the inverter output voltage,

means for deriving three-phase reference waves displaced 120° apart each of which has a period which includes a predetermined number of said constant volt/hertz pulses,

means for controlling the fundamental output voltages of individual phases of the bridge inverter in accordance

with respective said three-phase reference waves and including pulse width modulating means for switching individual phases of said bridge inverter in accordance with said constant volt/hertz pulses, and



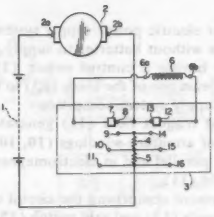
voltage boost means for increasing the frequency of said constant volt/hertz pulses at motor speeds below a predetermined speed to thereby increase the number of constant volt/hertz PWM pulses during each cycle of motor frequency voltage and provide a boost in inverter output voltage at low frequencies.

3,971,973

RHEOSTATIC CONTROL SYSTEM FOR A DC MOTOR

Yoshinori Nakano, Tokoname, Japan, assignor to Nippondenso Co., Ltd. and Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, both of Kariya, Japan

Filed July 23, 1974, Ser. No. 491,126
Claims priority, application Japan, July 24, 1973, 48-83814
Int. Cl.² H02P 7/08
U.S. Cl. 318—251 **12 Claims**



1. A motor control system for an electric car including a D.C. motor having an armature, a field coil, two polarity changing terminals and two power supply terminals, one of which is connected to one terminal of a D.C. power supply, said D.C. motor forming a drive source for the electric car, said two polarity changing terminals being connected between terminals of either said armature or said field coil and said two power supply terminals being connected between terminals of the other, whereby the forward-backward rotation of said motor is controlled by changing the polarity of the voltage applied across said two polarity changing terminals from said D.C. power supply for forwardly or backward moving the electric car, said motor control system comprising:

a. forward actuating means,

b. independently actuable backward actuating means,

c. slidable variable resistor means connected to said D.C. power supply and said D.C. motor and including at least a stopping stationary contact and a speed controlling resistor, one of which is connected to either one of the remainder of said two power supply terminals and the other terminal of said D.C. power supply and the other of which is connected to the other, a forward slidable contact connected to one of said two polarity changing terminals and actuated by said forward actuating means to make electrical contact with or break electrical contact of said stopping stationary contact and said speed controlling resistor, and a backward slidable contact connected to the other of said two polarity changing terminals and actuated by said backward actuating means to make electrical contact with or break electrical contact of said stopping stationary contact and said speed controlling resistor,

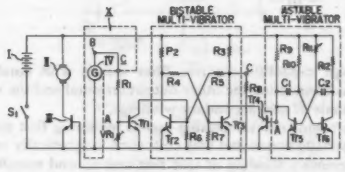
whereby the forward movement and the speed of the electric car are controlled by the operation of said forward actuating means and the backward movement and the speed of the electric car are controlled by the operation of said backward actuating means.

3,971,974

APPARATUS FOR CONTROLLING THE SYNCHRONOUS DRIVE FOR DIRECT-CURRENT MOTORS

Toshikazu Ichiyanagi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 7, 1974, Ser. No. 467,741
Claims priority, application Japan, May 9, 1973, 48-51377
Int. Cl.² H02P 5/00
U.S. Cl. 318—341 **12 Claims**



1. A system for controlling the synchronous drive for direct-current motors comprising a direct-current power source, a direct-current motor connected with said power source, rotational speed detection means for detecting the rotational speed of said direct-current motor and generating a signal in proportion to said speed, means for generating a predetermined reference signal to rotate the direct-current motor at a constant speed, and controlling means for controlling an applied voltage of the direct-current motor, said controlling means including means for receiving both signals as described above and comparing the same to generate a motor-speed controlling signal in response to the output therefrom, and means for regulating a signal applied to the motor disposed in relation to said signal generation means and said rotational speed detection means in order to regulate a crest value of an output generated by said signal generation means, whereby time for applying the voltage to the direct-current motor may be set such that said motor is maintained at a constant speed.

3,971,975

SWITCHING REGULATOR EMPLOYING BIASED SATURABLE CORE REACTORS

Luther L. Genult, Scottsdale, Ariz., assignor to Honeywell Information Systems, Inc., Phoenix, Ariz.

Filed June 26, 1975, Ser. No. 590,541
Int. Cl.² H02M 3/315
U.S. Cl. 321—18 **7 Claims**

1. A switching regulator for providing a high current low voltage regulated output from a high voltage source comprising:

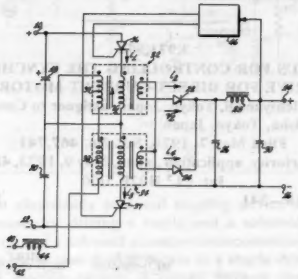
a. first and second input terminals for receiving said high voltage source;

b. first and second output terminals for said regulated output;

c. capacitive commutating means connected across said first and second input terminals;

d. first and second biased saturable reactor transformers each having a primary winding and a secondary winding;

e. first and second control switching devices;
f. mean serially connecting said first switching device, the primary winding of said first transformers, the primary winding of said second transformer, and said second switching device between said first and second input terminals and means connecting the common terminals of said primary windings to said commutating means;
g. an output rectification and filter means including first and second Schottky Barrier Diode rectifiers, each of said rectifiers connected to a first terminal of a secondary winding of said first and second transformers and to an output terminal



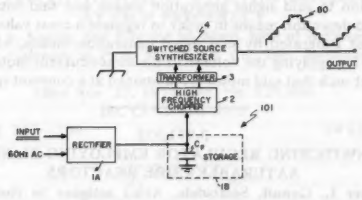
through capacitive-reactive filter means with conductive means connecting the other output terminal and the second terminals of said secondary windings;
h. transformer reactor biasing means including first and second serially connected bias coils each magnetically coupled to a primary winding of said first and second transformers and a bias choke serially connected therewith for storing and transferring energy through said bias coils to said output rectification and filter means; and
i. control signal means responsive to the output voltage and providing control signals to alternately render conductive said first and second controlled switching devices.

3,971,976

ELECTRIC POWER SUPPLY

Richard H. Baker, Bedford, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Feb. 10, 1975, Ser. No. 548,480
Int. Cl.² H02M 5/45
U.S. Cl. 321—4 **31 Claims**



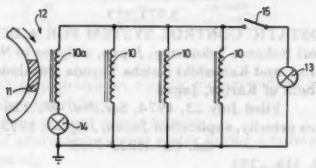
1. A frequency changer for power systems that comprises, in combination:
a source of DC potential;
means for changing the DC output voltage of said source to a series of high-frequency voltage pulses;
a transformer connected to receive the series of high-frequency voltage pulses as input to the primary winding thereof and to produce as output from the secondary winding thereof a transformed series of high-frequency voltage pulses; and
an electric stage having an input and an output, first bilateral switch means and second bilateral switch means, said electric stage further including rectifying means connected to receive the output from the transformer secondary and operable to rectify the same, said electric stage further including supply voltage means connected to receive and store the rectified voltage, the first bilateral switch means and the second bilateral switch means acting in combination such that the input and the output of the electric stage are connected together and therefore at equal potential or such that the supply voltage means is connected between the input and the otput of the stage such that the output of the stage is positive with respect to the input of the stage or the output is negative with respect to the input of the stage as conditions of system operation.

3,971,977

MAGNETO GENERATOR SUPPLIED BATTERY-LESS ELECTRIC POWER SUPPLY SYSTEM PARTICULARLY FOR MOTOR VEHICLES

Adam Hirt, Wachendorf, and Herbert Roderer, Nurnberg, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Feb. 14, 1975, Ser. No. 549,992
Claims priority, application Germany, Feb. 27, 1974, 2409365
Int. Cl.² B60Q 1/26; B62J 5/06
U.S. Cl. 322—1 **8 Claims**



1. Generator electric power supply system, particularly for motor vehicles without batteries to supply at least two loads (13, 14) and having a control switch (15) for selectively connecting at least one of the loads (13) to the supply system, in which the supply system comprises
a permanent magnet field (11) generator (12) having a plurality of armature windings (10, 10′, 10″, 10*a*) connected in parallel and in electromagnet coupled relation to the field (11),
the improvement comprising the circuit combination of one of the loads (13) and said switch (15) being connected in series and the series connection (13, 15) of the load-and-switch being connected in parallel to said generator windings (10, 10′, 10″, 10*a*) with
a second load (14) being connected in series with at least one of the generator windings (10*a*) and in advance of the connection of said at least one generator winding (10*a*) to the parallel connection of the other generator windings (10, 10′, 10″), said generator windings being located relative to said field (11) to have in-phase voltages induced therein.

3,971,978

GENERATOR CONTROL SYSTEM

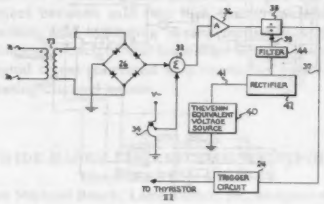
George S. Chambers, Waynesboro, and Lawrence J. Lane, Stuarts Draft, both of Va., assignors to General Electric Company, Salem, Va.

Filed Aug. 26, 1975, Ser. No. 607,784
Int. Cl.² H02P 9/14
U.S. Cl. 322—68 **8 Claims**

1. In a generator field excitation system of the type in which the generator output is utilized to provide an excitation current to the generator field winding through an exciter circuit

and which further includes means responsive to control pulses to selectively short-circuit the field winding during a portion of each cycle of normal generator operation, means to develop said control pulses comprising:

a. circuit means for providing said control pulses in response to a variable input signal;
b. means to provide a reference signal of desired magnitude;
c. means to provide an additional signal proportional to the amount of field excitation;



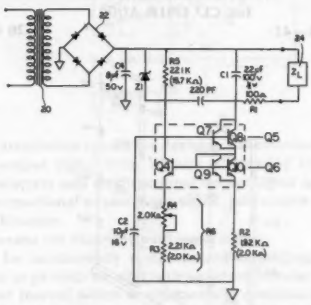
d. means to compare said reference signal and said additional signal to provide an error signal proportional to the algebraic sum thereof:
e. means to provide a correction signal proportional to the Thevenin equivalent voltage of the exciter circuit; and,
f. means to divide said error signal by said correction signal to provide said variable input signal.

3,971,979

CURRENT/VOLTAGE TRANSDUCER

Glenn A. Mayfield, Columbus, Ohio, assignor to Esterline Corporation, New York, N.Y.

Filed Oct. 10, 1974, Ser. No. 513,530
Int. Cl.² G05F 3/08
U.S. Cl. 323—1 **9 Claims**



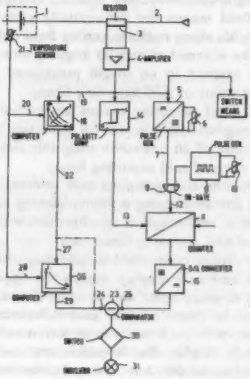
1. In a magnitude transducer for driving an output load with a direct current which is directly proportional to the magnitude of a voltage or current sinusoid at a selected part of an electrical circuit, said transducer being of the type including a coupling means connected at its input to said electrical circuit, a rectifier means connected to the output of said coupling means for providing a rectified sinusoid corresponding to the magnitude of said voltage or current sinusoid, and a current mirror circuit having a reference input branch connected to the output of said rectifier means and having said output load connected between the output branch of said current mirror circuit and the output of said rectifier means, said current mirror circuit including a first semiconductor junction sampling means for sampling the current in one of said branches and a second semiconductor means for controlling the current in the other branch, wherein the improvement comprises: an emitter resistor connected in each of said branches, the resistance of said emitter resistors being offset from being integrally proportional so as to provide a current imbalance in said current mirror by an amount sufficient to provide a non-linear characteristic in said current mirror for compensating other non-linearities of said transducer to provide improved transducer linearity.

3,971,980

BATTERY TESTING APPARATUS

Leopold Jungfer; Dieter Kautschitsch, both of Feistritz, and Richard Weber, Klagenfurt, all of Austria, assignors to Firma Akkumulatorenfabrik Dr. Leopold Jungfer, Feistritz im Rosental, Austria

Filed Dec. 20, 1974, Ser. No. 535,201
Claims priority, application Austria, Jan. 11, 1974, 245/74
Int. Cl.² G01N 27/42
U.S. Cl. 324—29.5 **8 Claims**



1. An apparatus for measuring the charge condition of a secondary cell, comprising, in combination:

electric sensing means coupled to said cell and operable for producing a first signal substantially proportional to current flowing in or out of said cell;

first conversion means coupled to said first signal and operable for producing a second signal substantially proportional to the consumed ampere-hours of said cell measured from a predetermined full charge condition and compensating for any subsequent charging;

a temperature sensor operable for producing a third signal as a function of the temperature near said cell;

second conversion means coupled to said first and third signals and operable for producing a fourth signal substantially proportional to the estimated available ampere-hours of said cell with respect to said full charge condition as a function of said first signal, and said third signal; and

a comparator coupled to said second and fourth signals and operable for producing a fifth signal representing the relative amplitudes of said second and fourth signals, whereby said fifth signal represents a measure of the charge condition of said cell.

3,971,981

MAGNETISM DETECTING SYSTEM

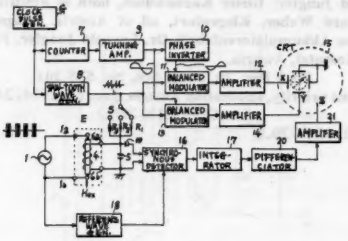
Yukio Nakagome, Yokohama; Teruji Watanabe, Niza; Takasuke Fukui, Tokyo, and Shizuo Suzuki, Kawasaki, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Filed Sept. 26, 1974, Ser. No. 509,445

Claims priority, application Japan, Oct. 1, 1973, 48-109320; Nov. 2, 1973, 48-123875

Int. Cl.[2] G01R *33/02*; G01C *17/28*

U.S. Cl. 324—43 R 4 Claims



1. A magnetism detecting system, comprising: reference magnetic field means for sequentially generating reference magnetic fields along radial scanning lines defined by dividing a plane to be scanned at regular angular intervals of a desired angle with respect to an origin positioned at the common intersecting point of said scanning lines;

magnetic field detecting means associated with said reference magnetic field means for detecting the direction and magnitude of an unknown magnetic field to be detected along each of said scanning lines;

display means connected to said reference magnetic field means for developing a planar display of said plane with respect to said origin in synchronism with the scanning of each of said scanning lines; and

compare means connected to said magnetic field detecting means and said display means for applying a detected output to said display means when the unknown magnetic field to be detected and said reference magnetic field coincide with each other in direction and in magnitude to angularly display the direction and radially display the magnitude of the detected unknown magnetic field on said planar display.

3,971,982

PLURAL FREQUENCY MULTI-PHASE TRANSDUCER ARRANGEMENT FOR DETECTING THE PRESENCE AND LOCATION OF FAULTS IN A METAL BODY AND COMPENSATING FOR BODY MOVEMENTS

Bengt Törnblom, Vasteras, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Continuation-in-part of Ser. No. 570,619, April 23, 1975, abandoned, which is a continuation-in-part of Ser. No. 480,427, June 18, 1974. This application Apr. 30, 1975, Ser. No. 573,252

Claims priority, application Sweden, Apr. 23, 1974, 7405409

Int. Cl.[2] G01R *33/12*

U.S. Cl. 324—37 1 Claim

1. Apparatus for testing metal bodies comprising:

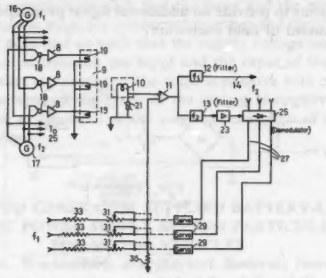
a. a first multi-phase generator having a first frequency:

b. a second multi-phase generator having the same number of phases as said first generator but having a different frequency

c. means for summing the outputs of said first and second multi-phase generators;

d. a first plurality of transducers coils comprising at least one coil for each phase of said first and second multi-phase generators, the individual coils being coupled to the individual phase outputs of said means for summing so as to induce a moving field in said body when fed with a multi-phase current from said multi-phase generator;

e. a single secondary coil surrounding said metal body, said secondary coil detecting variations in the magnetic field generated by said transducers coils which occur when



faults and irregularities in the body being tested are encountered; and means responsive to the output of said secondary coil at one of said frequencies for correcting the output of said secondary coil at the other frequency for variations of the position of the test object within said secondary transducer coil.

3,971,983

FERROMAGNETIC METAL DETECTOR UTILIZING GRADIOMETERS POSITIONED ON OPPOSITE SIDES OF THE DETECTION AREA WITH OVERLAPPING SENSITIVITY

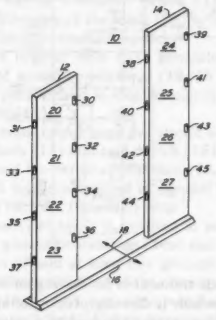
James R. Jaquet, Wilmington, Del., assignor to Infinetics, Inc., Wilmington, Del.

Filed June 6, 1972, Ser. No. 260,152

The portion of the term of this patent subsequent to July 27, 1992, has been disclaimed.

Int. Cl.[2] G01R *33/00*

U.S. Cl. 324—41 20 Claims



1. Apparatus for detecting the presence of a ferromagnetic object passing through a station and indicating the location of said ferromagnetic object, comprising:

a first and a second member at said station, said first and second member having a plurality of gradiometers mounted thereon, each of said plurality of gradiometers having a predetermined pattern or area of sensitivity to magnetic fields which is substantially less than the total area between said first and second members, each of said plurality of gradiometers generating an output signal indicative of a change in the earth's magnetic field in response to the presence of a ferromagnetic object;

means for individually processing output signals generated by each of said plurality of gradiometers, said processing means being comprised of a plurality of processing channel means, each processing channel means receiving the output of at least one respective gradiometer and being operative to generate a digital signal in response to a predetermined change in the earth's magnetic field within the pattern or area of sensitivity to magnetic fields of said at least one respective gradiometer of said plurality of gradiometers; and

means for indicating the position of said ferromagnetic object between said first and second members of said station, said indicating means including a plurality of indicators, each of said indicators being responsive to the digital signal generated in a respective one of said processing channel means.

3,971,984

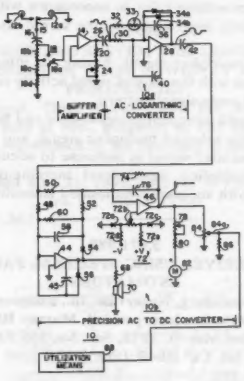
WIDE-RANGE LOGARITHMIC RESPONDING TRANSLATION CIRCUIT

Stephen Michael Bench, Lake Zurich, Ill., assignor to B-Cubed Engineering, Inc., Elgin, Ill.

Filed Sept. 4, 1974, Ser. No. 502,948

Int. Cl.² G01R *15/10, 19/22*

U.S. Cl. 324—132 **18 Claims**



1. A translation circuit for deriving a substantially unidirectional output signal from a given alternating current input signal wherein said unidirectional output signal is logarithmically proportional to said input signal, said circuit comprising, in combination:

input means for receiving said input signal;

means for substantially symmetrically amplifying said input signal to provide an alternating current interim signal at an output thereof which is substantially continuously proportional to the logarithm of said input signal;

said amplifying means having a bidirectional feedback loop for coupling alternating current feedback signals indicative of said interim signal to the input of said amplifying means, and said feedback loop including means responsive to said input signal for controlling the gain of said amplifying means over a range of gains including the open loop gain of said amplifying means; and,

means for rectifying said interim signal to provide said unidirectional output signal wherein said rectifying means comprises a precision AC/DC converter including at least one operational amplifier having an input coupled to an output of said means for amplifying said input signal, and said operational amplifier having a feedback loop which includes means for reducing the input threshold voltage of said operational amplifier wherein said threshold voltage is divided by the open loop gain of said operational amplifier.

3,971,985

AUTOMATIC CONTROL SYSTEM FOR CONDITION-RESPONSIVELY SWITCHING OVER TRANSCEIVER AND RADIO OR TAPE RECORDER AUDIO SIGNALS

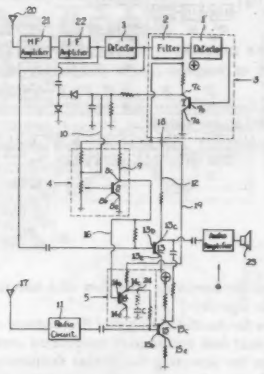
Kazuo Arai, Kitamoto, Japan, assignor to Nissan Denshi Company Limited, Ohmiya, Japan

Filed Mar. 7, 1975, Ser. No. 556,491

Claims priority, application Japan, Nov. 15, 1974, 49-137575[U]; Dec. 28, 1974, 49-2433[U]

Int. Cl.² H04B *1/40*

U.S. Cl. 325—21 **2 Claims**



1. Automatic signal switching apparatus for interrupting the reproduction of audio signals from a source during the receipt of signals from a transceiver and reproducing the transceiver signals comprising signal reproducing means, a first amplifying transistor connected to said source to said reproducing means for feeding signals from said source to said reproducing means, a second amplifying transistor connected to said transceiver and to said reproducing means, a squelch control transistor having a base and emitter and collector electrodes, means applying a potential between the emitter and collector of said control transistor, means coupling the base of said control transistor to said transceiver to modify conductivity of said transistor upon receipt of a transceiver signal and produce a potential change of a least one of said electrodes, means couling the last said electrode to said first amplifying transistor to inactivate it upon the occurrence of said potential change and terminate the reproduction of said source signals and means coupling the last said electrode to said second amplifying transistor to activate it and feed said transceiver signals to said reproducing means whereby signals from said source will be reproduced during the absence of a transceiver signal and will be interrupted during the presence of a transceiver signal.

3,971,986

REMOTE CONTROL SYSTEM FOR RADIO RECEIVER

Yasuhiro Hideshima, and Masakatsu Toyoshima, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 21, 1974, Ser. No. 499,211

Claims priority, application Japan, Aug. 23, 1973, 48-94714

Int. Cl.² H04B *1/00*

U.S. Cl. 325—37 **5 Claims**

1. An information transmitting system comprising a transmitter and at least one receiver, said transmitter including:

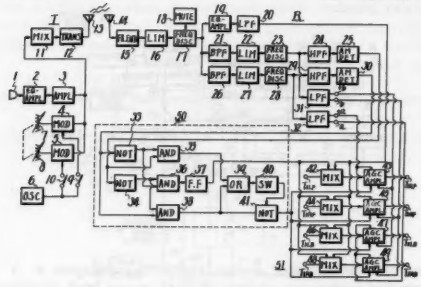
a. means for producing first and second carrier signals each having a predetermined frequency;

b. first means for modulating said first and second carrier signals with a first remote control signal;

c. second means for controlling the center frequency of said first carrier signal in such a manner that the center frequency of said carrier is shifted within a predetermined frequency range;

d. third means for controlling the center frequency of said second carrier signal in such a manner that the center frequency of said carrier is shifted within a predetermined frequency range; and

e. means for transmitting said first and second modulated carrier signals; and said receiver including:



a. means for receiving said first and second modulated carrier signals;

b. means for demodulating said first remote control signal from said first and second modulated carrier signals;

c. means for detecting the center frequency changes of said first carrier and producing a second remote control signal; and

d. means for detecting the center frequency changes of said second carrier and producing a third remote control signal, thereby to provide three control signals for controlling said receiver.

3,971,987

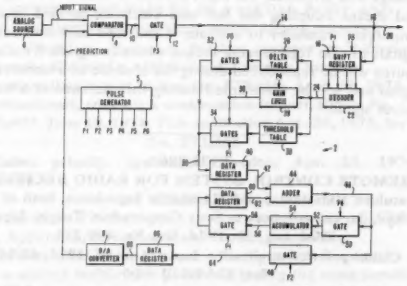
GAIN METHOD AND APPARATUS FOR A DELTA MODULATOR

Francis P. Carrubba, North Haven, Conn.; Peter A. Franaszek, Ossining, and David D. Grossman, Yorktown Heights, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 7, 1975, Ser. No. 548,044

Int. Cl.² H03K *13/22*

U.S. Cl. 325—38 B **4 Claims**



1. In a delta modulator, a method of generating and then decoding code symbols representing increments of signal level, with each code symbol being determined in accordance with the difference in signal level between an input signal and a prediction signal which is a representation of said input signal, with said prediction signal being formed by accumulation of successive signal increments which depend on the history of said code symbols, said method comprising the steps of:

storing a sequence of generated code symbols, said sequence including the most recent code symbol and a given number of preceding code symbols, with the pattern of stored code symbols at any instant defining a state of signal activity;

selecting three signals in accordance with the state of signal activity represented by the stored code symbol pattern, namely an incremental signal level, a threshold value and a modifier signal;

modifying said incremental signal level and said threshold value an amount determined by said modifier signal;

forming a new prediction signal by accumulation of successive modified signal level increments which are summed with successive modified threshold values; and

generating a new code symbol in response to comparing said new prediction signal with said input signal;

said method including the steps of decoding comprising:

storing a sequence of said code symbols, said sequence including the most recent code symbol and a given number of preceding code symbols, with the pattern of code symbols at any instant defining a state of signal activity;

selecting an incremental signal level in accordance with the state of signal activity represented by the stored code signal pattern;

selecting a smoothing value in accordance with the state of signal activity represented by the stored code signal pattern;

selecting a multiplier signal, having an integer value, in accordance with the state of signal activity represented by the stored code signal pattern;

multiplying said incremental signal level and said smoothing value by the selected multiplier signal; and

forming a decoded signal in response to accumulating successive multiplied signal level increments which are summed with successive multiplied smoothing values.

3,971,988

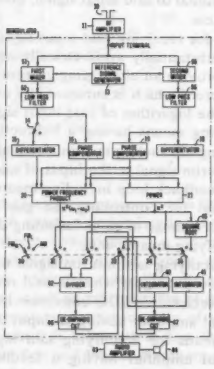
AM/FM RECEIVER USING SPECTRAL PARAMETER ESTIMATORS

Jeffrey Neil Denenberg, Naperville, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 6, 1975, Ser. No. 555,739

Int. Cl.² H04B *1/06*; H03D *3/00*

U.S. Cl. 325—316 **11 Claims**



2. A receiver for producing signals corresponding to the

modulating signals of applied frequency modulated radio frequency signals comprising:

an antenna;

radio frequency amplification means comprising:

an input connected to said antenna;

an output terminal; and

means for generating a signal at said last mentioned output terminal corresponding to a signal present at said input amplified by a predefined factor; and

a demodulation circuit comprising:

an input;

an output;

and means for generating at said demodulation circuit output a signal corresponding to an estimate of the power mean frequency of said applied signal utilizing: a circuit for generating a signal corresponding to the instantaneous power of said applied signal and a circuit for generating a signal corresponding to the instantaneous power frequency product of said applied signal, first and second integrator circuits for integrating said instantaneous power and said instantaneous power frequency product signals and a divider circuit for providing said estimate of said power mean frequency signal corresponding to the ratio of said integrated power frequency product signal to said integrated instantaneous power signal.

3,971,989

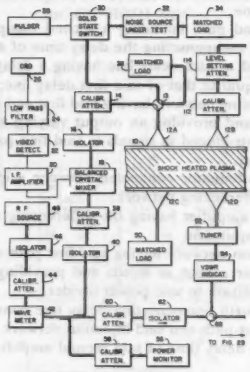
METHOD AND SYSTEM FOR ABSOLUTE MEASUREMENT OF NOISE POWER AT ALL RADIO FREQUENCIES

Abraham Singer, Silver Spring, and Jan M. Minkowski, Baltimore, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 21, 1975, Ser. No. 579,644

Int. Cl.² H04B 17/00

U.S. Cl. 325—363 **11 Claims**



1. A method of measuring data suitable for use in measuring noise power of a noise source under test utilizing a shock-heated gas in a gas-driven shock tube, as a primary standard, said shock tube having an observation section, and an expansion chamber comprising the steps of:

shock-heating said gas in the expansion chamber of said shock tube to generate a shock wave therein;

measuring the radiation generated by the shock-heated gas in said observation section with a microwave measuring system as a signal related to the noise power generated by said shock-heated gas;

measuring a signal representative of the noise power generated by said noise source under test;

determining the ratio of said signal representative of the noise power generated by said shock-heated gas and the signal representative of the noise power generated by said noise source under test; and

determining the degree of impedance mismatch between the shock-heated gas in the observation section of said shock tube and the microwave measuring system;

whereby the noise power of said noise source under test can be calculated, as a function of said ratio and said degree of mismatch.

3,971,990

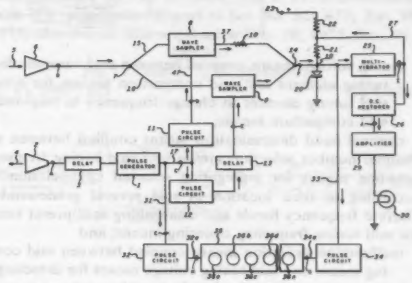
BASE-BAND PULSE OBJECT SENSOR SYSTEM

Gerald F. Ross, Lexington, Mass., assignor to Sperry Rand Corporation, New York, N.Y.

Division of Ser. No. 377,853, July 9, 1973, which is a division of Ser. No. 134,990, April 19, 1971, Pat. No. 3,772,697. This application Feb. 26, 1975, Ser. No. 553,345

Int. Cl.² H04B 1/16

U.S. Cl. 325—400 **3 Claims**



1. Gain control apparatus for control of the amplitude of and for selecting base-band signals propagating is non-dispersive transmission line means between input means and utilization means responsive to selected ones of said base-band signals, said non-dispersive transmission line means including first and second parallel-connected non-dispersive transmission lines, said gain control apparatus comprising:

first and second wave-sampling means respectfully disposed in series relation within said respective first and second parallel-connected non-dispersive transmission lines,

attenuator means disposed within said first parallel-connected transmission line in series with said first wave sampling means, and

wave sampler pulsing means for activating said first and second wave sampling means in first and second discrete time intervals for propagation of selected attenuated base-band signals to said utilization means during said first time interval and of selected directly propagated base-band signals to said utilization means during said second time interval.

3,971,991

TELEVISION TUNING SYSTEM WITH VARACTOR MALFUNCTION DETECTION

Akio Tanaka, Evanston, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Sept. 4, 1974, Ser. No. 503,122

Int. Cl.² H04B 1/16

U.S. Cl. 325—464 **11 Claims**

1. A television tuning control system comprising:

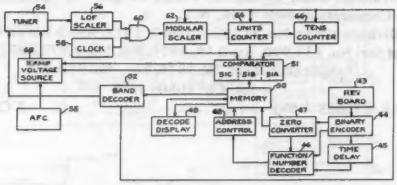
a tuner having a varactor diode tuning element operating in several predetermined discrete frequency bands contain-

ing a plurality of fixed bandwidth signals indentified by assigned channel numbers;

tuning frequency counting means, employing preset counts corresponding to said frequency bands and sampling the frequency of said varactor diode tuning element, for deriving from the frequency of said tunable element, information indicative of the channel number of the corresponding receivable television channel;

channel number selection means;

comparison means coupled between said tuning frequency counting means and said channel number selection means for comparing desired channel number information from said channel number selection means with derived channel number information from said tuning frequency counting means;



tuning voltage means coupled between said varactor diode tuning element and said comparison means, for driving said tuning element to change frequency in response to said comparison means;

channel band determination means coupled between said channel number selection means and said tuning frequency counting means for segregating selected channel numbers according to their location in said several predetermined discrete frequency bands and establishing said preset counts for said tuning frequency counting means; and

malfunction detection means coupled between said counting means and said tuning voltage means for detecting an improper number of pulses from said counting means and forcing said tuning voltage means to drive said varactor diodes tuning element in a direction opposite to that indicated by said comparison means.

3,971,992

APPARATUS FOR PRESETTING RECEIVERS OF THE SYNTHESIZING TYPE

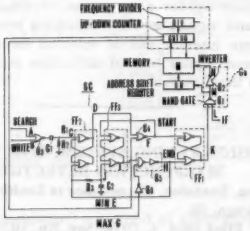
Noboru Saikaishi; Tsuneo Yamada; Tetsuo Takahashi, and Yukio Numata, all of Tokyo, Japan, assignors to Trio Electronics Incorporated, Tokyo, Japan

Filed Sept. 17, 1974, Ser. No. 506,789

Claims priority, application Japan, Dec. 28, 1973, 49-2115

Int. Cl.[2] H04B *1/32*

U.S. Cl. 325—464 **4 Claims**



1. Apparatus for presetting a receiver comprising a memory device, and up-down counter constructed to send out control signals at the counts thereof corresponding to the opposite ends of a frequency band to which said receiver can respond and to exchange data with said memory, an address shift register for designating an address in said memory device, means for generating a search signal and a write signal, a flip-flop circuit conditioned by said search and write signals to be set and reset by said control signals when said search and write signals are supplied to said flip-flop circuit, and a gate circuit responsive to said flip-flop circuit and to detecting an intermediate frequency output for sending a write enabling signal to said memory device for storing the content of said up-down counter in said memory device and for sending a shift signal to said address shift register each time said intermediate frequency output is obtained between the set and reset states of said flip-flop circuit.

3,971,993

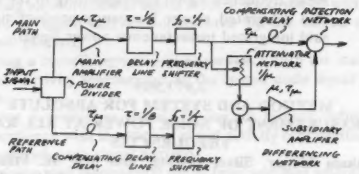
HIGH CAPACITY RECIRCULATING DELAY LOOP INTEGRATOR

James N. Constant, 1603 Danbury Drive, Claremont, Calif. 95612

Filed Apr. 21, 1972, Ser. No. 246,299

Int. Cl.[2] H03B *1/04*

U.S. Cl. 328—127 **6 Claims**



1. A signal integrating system comprising a recirculating delay loop integrator including a delay network having feedforward error correction and time delay means wherein said network includes:

a power divider defining a first main signal path and a second reference signal path,

said first path including a first main amplifier and a first delay line,

said second path including a second compensating delay line for compensating the delay time of said first amplifier, and a third delay line having a delay time substantially equal to that of said first delay line;

a differencing network having said first and second paths as inputs and providng an output varying as a function of error introduced in signals in said first path by said first amplifier,

with an attenuator connected between said first path and said differencing network;

a second amplifier having the differencing network output as an input; and

an injection network having said first path and said second amplifier output as inputs and providing an output for recirculation to said power divider,

with a fourth compensating delay line connected between said first path and said injection network for compensating the delay time of said second amplifier.

3,971,994

FREQUENCY COMPARISON CIRCUIT

Geoffrey Shepherd, Oldham, England, assignor to Ferranti, Limited, Hollinwood, England

Filed Feb. 11, 1974, Ser. No. 441,315

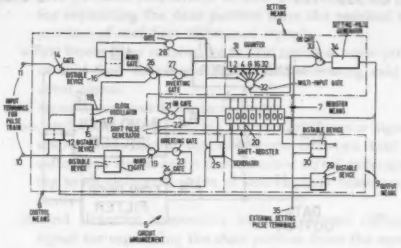
Claims priority, application United Kingdom, Feb. 17,1973, 6769/73

Int. Cl.[2] G01R *23/00;* H03D *13/00;* H03K *5/20*

U.S. Cl. 328—133 **10 Claims**

1. A pulse frequency comparison circuit arrangement for comparing the repetition frequencies of two pulse trains comprising register means operable to store a binary number and responsive to a pulse of one of said trains to cause the number

to be increased and responsive to a pulse of the other of said trains to cause the number to be decreased, control means connected to said register means and adapted to receive said pulse trains and being operable to sample the pulse trains alternately and provide an output to the register means in response to the application any pulse appearing on each train since the previous sample of that train to the register means such that pulses of each train are applied, one at a time, and cause oscillation of the stored binary number between two



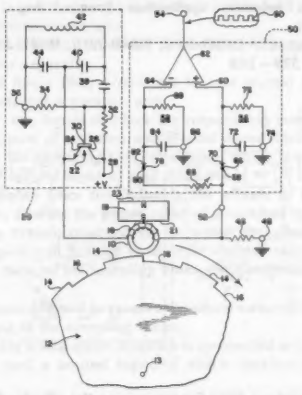
adjacent values when the frequencies are the same and cause the binary number to increase or decrease when the frequencies are different, setting means connected to said control means and responsive to a predetermined number of pulses of one pulse train to cause the register means to store a predetermined binary number, and output means connected to said register means and operable to provide an indication when a specified upper or lower binary number is stored in said register means.

3,971,995

WHEEL VELOCITY SENSOR WITH EXCITER RING RUNOUT COMPENSATION

Rand Jeffrey Eikelberger, Glenview, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Aug. 8, 1975, Ser. No. 602,938
Int. Cl.² H03H 7/06
U.S. Cl. 328—149 **2 Claims**



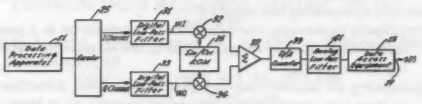
1. A velocity sensing circuit comprising a toroidal magnetic core positioned adjacent a rotating exciter member, the rotational velocity of which is to be sensed, having an alternating series of projections and spaces on its periphery, a winding inductively wound on said core, an alternating signal source coupled to said winding to supply a carrier signal thereto, an output circuit means comprising a comparator having a first noninverting input terminal and a second inverting input terminal, first demodulation means having a first input junction coupled to receive the composite modulated signal appearing on said winding and an output junction coupled to said first input terminal of said comparator having a first RC time constant of a value such that the desired velocity modulation signal and any undesired runout modulation signal may both be demodulated by said first demodulation means and a second demodulation means having a second input junction coupled to receive the composite modulated signal appearing on said winding and an output junction coupled to said second input terminal of said comparator which has a second RC time constant which is substantially larger than said first RC time constant and is of a value such that the desired velocity signal is not substantially demodulated and only the undesired runout modulation signal is substantially demodulated and applied to said second terminal by said second demodulation means.

3,971,996

PHASE TRACKING NETWORK

David M. Motley, Santa Ana, and King Y. Cheng, Tustin, both of Calif., assignors to Hycom Incorporated, Irvine, Calif.

Continuation of Ser. No. 376,464, July 5, 1973, abandoned, which is a continuation-in-part of Ser. No. 324,657, Jan. 18, 1973, abandoned. This application Feb. 10, 1975, Ser. No. 548,567
Int. Cl.² H03K 5/18; H04B 1/10
U.S. Cl. 328—155 **22 Claims**



1. A phase tracking network for correcting the phase of a noncoherently demodulated signal comprising:

a phase correction network having an inphase channel and a quadrature channel and adapted to receive at least a first portion of the noncoherently demodulated signal in the inphase channel and a second portion of the noncoherently demodulated signal in the quadrature channel, the phase correction network including means for substantially correcting the phase of the noncoherently demodulated signal to provide at least one phase corrected signal in both of said channels;

first means responsive to the phase corrected signal to provide at least one detected data signal;

second means responsive to at least one of the detected data signal and the phase corrected signal to provide a phase correction signal; and

said correcting means being responsive to the phase correction signal to make a correction to the phase of the noncoherently demodulated signal.

13. A phase tracking network adapted to correct the phase of a first signal, said phase tracking network comprising:

phase correction means for substantially correcting the phase of the first signal to provide at least one phase corrected signal;

first means responsive to the phase corrected signal to provide a phase error signal;

second means responsive to the phase error signal to provide a first phase correction signal for correcting a first kind of phase error in the first signal;

third means responsive to the phase error signal to provide a second phase correction signal for correcting a second kind of phase error in the first signal, said first kind of phase error being different from said second kind of phase error;

means for combining the first and second phase error signals to provide a combined phase correction signal;

said phase correction means being responsive to said combined phase correction signal to correct the first and second kinds of phase error in the first signal; and

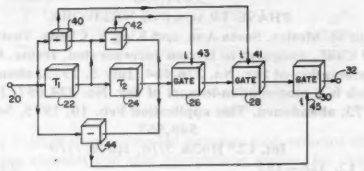
said first signal being noncoherently demodulated and said phase correction means including means for substantially correcting the phase of the noncoherently demodulated signal to provide said one phase corrected signal.

3,971,997

SEA SPIKE SUPPRESSION TECHNIQUE

Bernard L. Lewis, Oxon Hill, and Irwin D. Olin, Potomac, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 28, 1975, Ser. No. 581,502
Int. Cl.[2] H04B 1/10
U.S. Cl. 328—165 9 Claims



1. A method of detecting interference in received signal energy comprising the steps of:

examining said energy for interference modulation in a predetermined frequency range related to the interference inducing phenomena;

producing an interference-detected signal upon detection of at least one modulation component existing at at least one predetermined frequency;

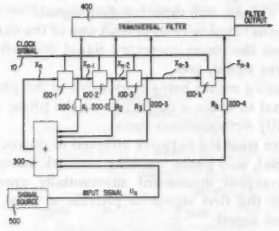
using said interference-detected signal to eliminate the presence of the interference-modulated signal.

3,971,998

RECURSIVE DETECTOR-OSCILLATOR CIRCUIT

Bhaskarpillai Gopinath, Berkeley Heights, N.J., and Robert Paul Kurshan, New York, N.Y., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 2, 1975, Ser. No. 574,028
Int. Cl.[2] H04B 15/00; H03B 1/04
U.S. Cl. 328—167 14 Claims



1. A signal detection circuit comprising:

a shift register;

means for multiplying the output signals of selected stages of said shift register by predetermined integers to cause the characteristic function of said circuit to be a cyclotomic polynomial;

means for forming a non-modulo sum of an input signal and of said integer multiplied signals; and

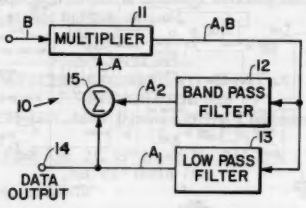
means for applying said sum to the first stage of said shift register.

3,971,999

COHERENT PHASE DEMODULATOR FOR PHASE SHIFT KEYED SUPPRESSED CARRIER SIGNALS

Gunars Bilsens, and Raymond Oscar Figueroa, both of Scottsdale, Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed June 23, 1975, Ser. No. 589,273
Int. Cl.[2] H03D 3/00
U.S. Cl. 329—105 2 Claims



2. A method of demodulating a suppressed carrier signal, phase modulated with data signal comprising the steps of:

multiplying the suppressed carrier signal by a feedback signal;

separating the products of the multiplication by filtering through a bandpass filter and a low pass filter respectively to produce a phase-coherent carrier and a data signal;

using the output terminal for the low pass filter as an output terminal for the data signal; and

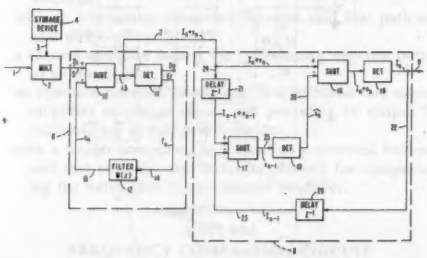
adding the phase-coherent carrier to the recovered data signal to produce the feedback signal.

3,972,000

PHASE FILTER FOR REDUCING THE EFFECTS OF THE NOISE COMPONENTS ALTERING DISCRETE PHASE MODULATED SIGNALS

André Eugené Desblache, Nice, France; Thomas Edwin Stern, Bronx, N.Y., and Philippe Emmanuel Thirion, St-Paul-de-Vence, France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 15, 1975, Ser. No. 596,557
Claims priority, application France, Aug. 30, 1974, 74.30001
Int. Cl.[2] H03D 3/00; H04B 1/10; H04L 27/22
U.S. Cl. 329—105 9 Claims



1. In a phase filter for minimizing the effects of noise components altering the value of the phase of a digital signal in a digital data transmission system in which the phase of said digital signal can assume Q distinct values representing the data, with said phase filter including two decision filters, with the first decision filter cancelling residual noise components representing the phase intercept component and the phase shift component introduced by frequency shift, and the second decision filter minimizing the random noise component

representing phase jitter and white noise, the combination comprising:

input means for receiving said digital signal;

said first decision filter including;

first means for providing a first difference signal in response to taking the difference between the received digital signal from said input means and a first error signal corresponding to an estimated value of said residual noise component,

a first detector responsive to said first difference signal for separating the data portion from the residual noise portion of said first difference signal;

a first linear filter responsive to said residual noise portion of said first difference signal for generating said first error signal,

said second decision filter including;

second means for providing a second difference signal in response to taking the difference between said first difference signal and a second error signal corresponding to an estimated value of said random noise component,

second detector responsive to said second difference signal for separating the data portion from the random noise portion of said second difference signal, with a data representative signal being provided at an output, and

a second linear filter responsive to said data representative signal for generating said second error signal.

8. In a phase filter to reduce the effects of the noise components altering the phase value of the received signal, in a digital data transmission system in which the phase of the emitted signals can assume Q discrete distinct values representing the data, at the sampling time, the combination comprising:

input means adapted to receive the phase value of the signal received at the sampling times,

a subtractor a first input of which is connected to said input means, and a second input of which receives an error signal,

a detector-separator connected to the output of said subtractor to separate the integral and fractional parts of the signal provided by said subtractor, said integral and fractional parts respectively corresponding to a data representative signal and to a noise residual component and being respectively supplied to first and second outputs of said detector-separator,

a first linear filter connected to said second output of said detector-separator,

a second linear filter connected to said second output of said detector-separator, and

an adder, two inputs of which are respectively connected to the outputs of said first and second linear filters, and an output for providing said error signal which is connected to said second input of said subtractor.

9. In a phase filter for reducing the effects of the noise components altering the phase value of a received signal, in a digital data transmission system in which the phase of the emitted signals can assume Q discrete distinct values representing the data, at the sampling times, the combination comprising:

input means adapted to receive the phase value of the signal received at the sampling times;

a subtractor a first input of which is connected to said input means and a second input of which receives an error signal;

a detector-separator connected to the output of said subtractor, to separate the integral and fractional parts of the signal supplied by said subtractor, said integral and fractional parts respectively corresponding to a signal representing the data and to a noise residual component which includes a residual random component and being respectively provided to first and second outputs of said detector-separator;

a first linear filter with transfer function

$$W(z) = \frac{2(1-\alpha)z^{-1} + (\alpha^2-1)z^{-2}}{(1-z^{-1})^2}$$

where,

z is the z-transform notation; and

α being a coefficient lying in the range $0 < \alpha < 1$;

connected to said second output of said detector-separator;

a first delay element introducing an elementary delay T equal to the sampling time period, connected to said second output of said detector-separator;

a first adder with two inputs, a first input of which is connected to the output of said first delay element;

an adaptive predictive filter the input of which is connected to the output of said first adder to generate said residual random component from the signals supplied by said first adder;

a second delay element identical to said first delay element the input of which is connected to the output of said adaptive predictive filter and the output of which is connected to the second input of said first adder; and

a second adder the inputs of which are respectively connected to the outputs of said first linear filter and said adaptive predictive filter, and the output of which is connected to said second input of said subtractor.

3,972,001

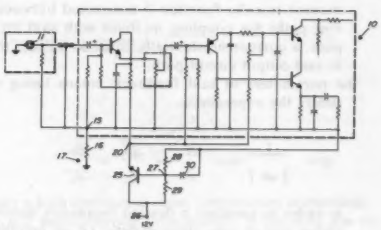
COMMON MODE REJECTION DYNAMIC FILTER CIRCUIT

Chris A. Petri, West Chicago, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 8, 1975, Ser. No. 566,640

Int. Cl.² H03F 1/26

U.S. Cl. 330—22 **3 Claims**



1. In amplifying circuitry having power receiving junctions and a common junction, a common mode rejection, dynamic filter circuit for substantially eliminating hum and the like, comprising:

a. impedance means including a resistor connected from the common junction of the amplifying circuitry to ground for electrically separating the amplifying circuitry from ground;

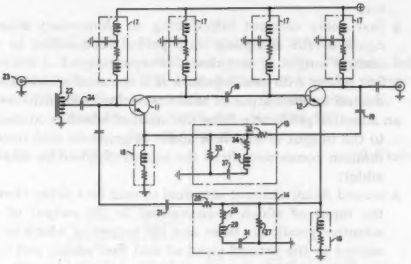
b. a transistor biased to operate in a linear region and connected from the power receiving junctions of the amplifying circuitry to a source of power, said transistor having a control electrode; and

c. a capacitor coupling the control electrode of said transistor to the common junction of the amplifying circuitry for controlling said transistor to vary the power applied thereto in a common mode with variations of potential at the common junction.

3,972,002
DUAL FEEDBACK AMPLIFIER

Thomas Joseph Aprille, Jr., Andover, Mass., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 30, 1974, Ser. No. 537,433
Int. Cl.² H03F 1/34
U.S. Cl. 330—28 4 Claims



1. A broadband amplifier circuit comprising:
- a high gain noninverting amplifier element having an input circuit path and an output circuit path,
- input means for coupling said input circuit path to a signal source having an impedance Z_S,
- output means for coupling said output circuit path to a load having an impedance Z_L,
- first frequency dependent feedback means having a voltage transfer function a connected between said circuit paths for coupling in series with said input circuit path a voltage substantially equal to a times the output voltage of said amplifier element,
- second frequency dependent feedback means having a current transfer function b connected between said circuit paths for coupling in shunt with said input circuit path, a current substantially equal to b times the current in said output circuit path,
- the parameters of said feedback means being chosen to satisfy the expressions

$$G = \frac{1}{|ab|} \text{ and } \frac{a}{b} = \frac{Z_S^*}{Z_L} = \frac{Z_S}{Z_L^*}$$

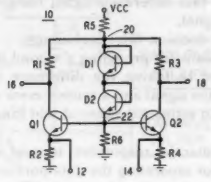
in order to generate a desired frequency dependent amplifier circuit gain characteristic G, an amplifier circuit input impedance substantially equal to Z_S^*, the conjugate of said source impedance Z_S, and an amplifier circuit output impedance substantially equal to Z_L^*, the conjugate of said load impedance Z_L, $1/|ab|$ being the reciprocal of the magnitude of the product of said transfer functions.

3,972,003
HIGH SPEED CURRENT DETECTION AMPLIFIER CIRCUIT

Paul Robert Schroeder, Wescosville, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 9, 1974, Ser. No. 496,147
Int. Cl.² H03F 3/45
U.S. Cl. 330—30 D 5 Claims

1. An amplifier circuit comprising:
- a first switching circuit means having a control terminal and first and second output terminals;
- a second switching circuit means having a control terminal and first and second output terminals, the first output terminals of the first and second switching means serving as separate amplifier circuit output terminals;
- the second output terminals of the first and second switching means serving as amplifier circuit input terminals;
- a first resistor circuit means being coupled to the second output terminal of the first switching means;
- a second resistor circuit means having first and second terminals, the first terminal of the second resistor means being coupled to the first output terminal of the first switching means;
- a third resistor circuit means being coupled to the second output terminal of the second switching means;
- a fourth resistor circuit means having first and second terminals, the first terminal of the fourth resistor means being

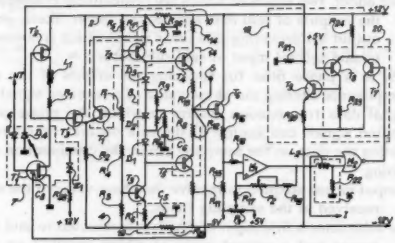


coupled to the first output terminal of the second switching circuit means;
- the second terminals of the first and third resistor circuit means being coupled together,
- range extender circuit means for increasing the operating range over which the amplifier is useful;
- the control terminals of the first and second switching circuit means being coupled together; and
- circuit means for providing an essentially constant current source, the circuit means being coupled to the second terminals of the first and third resistor means and to the control terminals of the first and second switching means through the range extender circuit means.

3,972,004
CHARGE PREAMPLIFIER

Gérard Libs, Gif-sur-Yvette, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Nov. 26, 1974, Ser. No. 527,201
Claims priority, application France, Nov. 27, 1973, 73.42158
Int. Cl.² H03F 3/16
U.S. Cl. 330—35 5 Claims



1. A charge preamplifier essentially comprising an input stage driven by the signal to be amplified, said stage being connected to an amplification stage which is in turn associated with an output stage, and a circuit for applying feedback from the output to the input of said preamplifier, said feedback being of the optoelectronic type, said input stage being such as to comprise a field-effect transistor cooled below ambient temperature, the signal to be amplified being applied to the input gate of said transistor, the load resistance of said transis-

tor being provided by a second field-effect transistor mounted in series with an inductance coil.

3,972,005

ULTRAWIDE BAND TRAVELING WAVE TUBE AMPLIFIER EMPLOYING AXIALLY CONDUCTIVE CIRCUIT LOADING MEMBERS

John E. Nevins, Jr., Encino, Calif., and Lester M. Winslow, Buffalo Grove, Ill., assignors to Varian Associates, Palo Alto, Calif.

Filed Dec. 16, 1969, Ser. No. 885,578
Int. Cl.² H01J 25/34
U.S. Cl. 330—43 **4 Claims**

1. In a traveling wave tube amplifier, means forming a helix derived slow wave circuit, a conductive sheath surrounding said slow wave circuit, means for projecting a stream of electrons along said slow wave circuit for electromagnetic interaction with signal wave energy on said slow wave circuit to produce an amplified output signal, means at the downstream end of said slow wave circuit for extracting the amplified output signal, THE IMPROVEMENT COMPRISING, means forming a conductive circuit loading structure disposed outside of and adjacent said slow wave circuit and extending along said circuit over more than one-half of its length for interrupting circumferentially directed currents associated with fields around the outside of said slow wave circuits while conducting currents along the length of said slow wave circuit to provide a phase velocity for signal wave energy which increases with frequency over the passband of said slow wave circuit to provide a nearly constant synchronism parameter over the passband of said slow wave circuit, said conductive loading structure including a plurality of elongated conductive vane members surrounding said slow wave circuit, said vane members being oriented to project radially inwardly from the wall of said conductive sheath towards said slow wave circuit, said vane members being axially directed of said slow wave circuit and terminating adjacent said slow wave circuit in radially spaced relation therefrom.

3,972,006

BANDPASS FILTER

Frank A. Ruegg, Brea, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Sept. 20, 1974, Ser. No. 507,687
Int. Cl.² H03F 1/36
U.S. Cl. 330—107 **2 Claims**

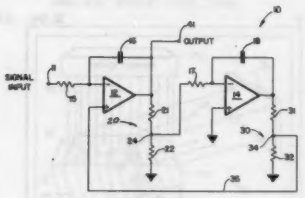
1. A bandpass filter circuit having a signal input terminal and a signal output terminal comprising:

at least first and second differential input amplifier stages, said signal input terminal being electrically connected to one differential input of said first amplifier stage and said signal output terminal being connected to an output of said first amplifier stage,

first capacitive feedback means electrically interconnected between the output of said first amplifier stage and said one differential input of said first amplifier stage,

second capacitive feedback means electrically interconnected between the output of said second amplifier stage and one input of the said second amplifier stage and adapted to pass signals thereto,

first adjustable resistor means interconnecting the output of said first amplifier stage to ground and second adjustable resistor means interconnecting the output of said second amplifier stage to ground,



circuit means connecting the output of said second amplifier stage to a second input of said first amplifier stage through part of said second adjustable resistor means and circuit means electrically connecting said one input of said second amplifier stage to the output of said first amplifier stage via part of said first adjustable resistor means, and

means connecting the second input of said second amplifier stage to ground.

3,972,007

LASER

Charles S. Naiman, Brookline, Mass.; E. P. Chicklis, Merrimack, N.H., and Arthur Linz, Winchester, Mass., assignors to Sanders Associates, Inc., Nashua, N.H.

Division of Ser. No. 249,172, May 1, 1972, Pat. No. 3,833,805.
This application Apr. 29, 1974, Ser. No. 465,193
Int. Cl.² H01S 3/16
U.S. Cl. 331—94.5 F **5 Claims**

1. A laser which operates at room temperature comprising:

a laser rod having strong fluorescence in the 0.85 um region;

aflashlamp optically coupled to said laser rod;

means for supplying electrical power to said flashlamp; and

a cavity.

3,972,008

METHOD AND APPARATUS FOR GENERATING COHERENT RADIATION IN THE ULTRA-VIOLET REGION AND ABOVE BY USE OF DISTRIBUTED FEEDBACK

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Melvin M. Saffren, Altadena, Calif.

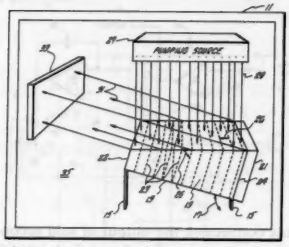
Filed Dec. 17, 1974, Ser. No. 533,556
Int. Cl.² H01S 3/081
U.S. Cl. 331—94.5 C **30 Claims**

1. A method for generating coherent radiation in the ultraviolet region, comprising:

establishing a bath of a liquid noble gas,

maintaining a standing wave in said bath; and

exciting the atoms of said noble gas to emit photons, whereby said photons are distributively reflected by the



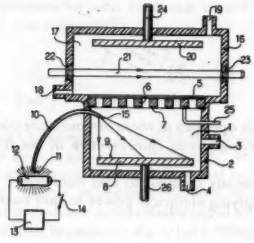
standing wave to produce further photon emission from other atoms of said liquid noble gas.

3,972,009

ELECTRON BEAM GENERATOR AND GAS LASER HEAD IN COMBINATION THEREWITH

Michel Duchet, Briis-sur-Orges, France, assignor to Compagnie Generale d'Electricite, Paris, France

Filed Mar. 13, 1975, Ser. No. 558,113
Claims priority, application France, Apr. 4, 1974, 74.11991
Int. Cl.² H01S 3/09
U.S. Cl. 331—94.5 PE 6 Claims



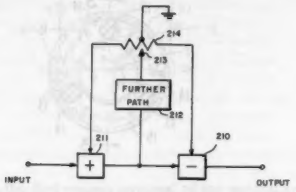
1. An electron beam generator comprising: an enclosure having a wall and containing a gas at low pressure; a first anode having a metallic sheet which is impermeable to the gas, forming part of said enclosure wall; a first metallic cathode contained in the latter, one of the faces of said cathode being situated facing said anode; means for applying to said anode a positive electric potential in relation to said cathode so as to set up a flux of electrons going from said cathode towards said metallic sheet, the latter being sufficiently thin to allow part of the flux to pass and hence form the electron beams; and means for illuminating said one face of the cathode that faces said anode by a source of ultra-violet radiation at the moment of the applying of the potential.

3,972,010

COMPRESSORS, EXPANDERS AND NOISE REDUCTION SYSTEMS

Ray Milton Dolby, 731 Sansome St., San Francisco, Calif. 94111

Division of Ser. No. 395,562, Sept. 10, 1973, Pat. No. 3,903,485, which is a continuation of Ser. No. 227,144, Feb. 17, 1972, abandoned, which is a continuation of Ser. No. 789,703, Jan. 8, 1969, abandoned, which is a continuation-in-part of Ser. No. 569,615, Aug. 2, 1966, abandoned. This application Dec. 20, 1974, Ser. No. 537,574
Claims priority, application United Kingdom, Jan. 10, 1968, 1540/68
The portion of the term of this patent subsequent to Sept. 2, 1992, has been disclaimed.
Int. Cl.² H04B 1/64
U.S. Cl. 333—14 2 Claims



1. A dynamic range processing method for processing an input signal to produce an output signal having a dynamic range selectively compressed or expanded relative to the dynamic range of said input signal, said method comprising

processing a first signal to produce a second signal by restricting, above a low-level threshold, the amplitude of said second signal,

selectively, for compressing said dynamic range, deriving said first signal from said output signal so that said first signal has dynamic range linearity relative to said output signal, and combining said second signal with a third signal derived from and having dynamic range linearity relative to said input signal, said combining being in such sense as to boost said third signal, and to produce said output signal, and

selectively, for expanding said dynamic range, deriving said first signal from said input signal so that said first signal has dynamic range linearity relative to said input signal, and combining said second signal with a fourth signal derived from and having dynamic range linearity relative to said input signal, said combining being in such sense as to buck said fourth signal, and to produce said output signal.

3,972,011

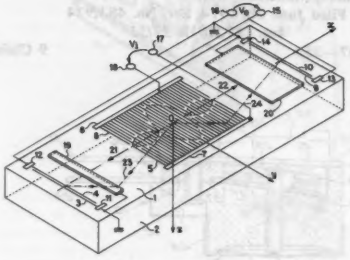
SURFACE ELASTIC WAVE ELECTROMECHANICAL DEVICE

Gérard Coussot, and Olivier Menager, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed July 8, 1975, Ser. No. 594,088
Claims priority, application France, July 12, 1974, 74.24364
Int. Cl.² H03H 9/26, 9/32; H01L 41/08
U.S. Cl. 333—30 R 10 Claims

1. An electromechanical surface elastic wave device for transmitting an electrical signal from one pair of terminals to a further pair of terminals, said device comprising: a substrate having a face for propagating surface elastic waves, and first and second electromechanical transducer means arranged at said face and respectively connected to said one pair and said further pair of terminals; said first and second electromechanical transducer means being arranged to effect selective energy transfer through the medium of said surface elastic waves; said first electromechanical transducer means comprising two

identical transducer structures having a common radiation axis and separated from one another by an interval; said second electromechanical transducer means comprising a further transducer structure producing bi-directional radiation along said radiaton axis; said further transducer structure being arranged in said interval midway between said identical transducer structures thereby providing two opposed arms transmitting said surface elastic waves in opposite directions; at least one of said opposed arms being equipped with intermediate means selectively changing the propagation characteristics of said surface elastic waves; the interconnection of said identical transducer structures ensuring in the absence of said intermediate means substantially zero electrical energy transfer between said one pair and said further pair of terminals.

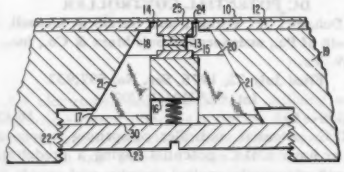


3,972,012

APPARATUS FOR MOUNTING A DIODE IN A MICROWAVE CIRCUIT

Shing-gong Liu, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 23, 1974, Ser. No. 535,815
Int. Cl.² H01P *3/00;* **H01L** *23/42, 23/44, 23/02*
U.S. Cl. 333—84 M **12 Claims**



1. An apparatus for mounting a diode in a microwave circuit, said microwave circuit including a conductor affixed to a substrate, said substrate having an aperture for receiving said diode to make contact with the surface portion of said conductor in register with said aperture, comprising:

means for resiliently pressing said diode into electrical contact with said conductor through said aperture; and

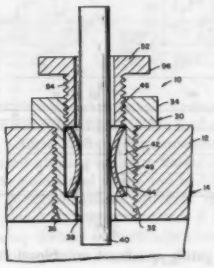
support means for fixedly supporting said resilient means, said support means having an elastically deformable portion to hold said diode substantially rigidly in contact with said conductor whereby said support means is prevented from jamming in position.

3,972,013

ADJUSTABLE SLIDING ELECTRICAL CONTACT FOR WAVEGUIDE POST AND COAXIAL LINE TERMINATION

Sanford S. Shapiro, Canoga Park, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Apr. 17, 1975, Ser. No. 566,881
Int. Cl.² H01P *1/28, 3/06*
U.S. Cl. 333—97 R **13 Claims**



1. An adjustable sliding electrical contact structure comprising:

a bushing for securement into the outer body wall of a waveguide, an interior space within said bushing terminated at one end by an axially facing wall and at the other end by a clamp movable with respect to said bushing, through said bushing, a conductor post positioned through said bushing opening;

a clamp member positioned in said interior space between said facing wall and said clamp and embracing said post, said clamp member being structured so that, when said clamp is urged toward said facing wall to stress said clamp member, said clamp member is forced into resilient engagement with said post.

3,972,014

FOUR QUADRANT SYMMETRICAL SEMICONDUCTOR SWITCH

Jearld L. Hutson, 2019 W. Valley View Lane, Dallas, Tex. 75234

Filed Nov. 11, 1974, Ser. No. 522,603
Int. Cl.² H01L *29/747*
U.S. Cl. 357—39 **23 Claims**

1. A semiconductor switching device having symmetrical performance characteristics comprising:

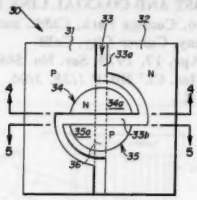
a. a semiconductor body formed from a plurality of semiconductor layers of alternating first and second conductivity types;

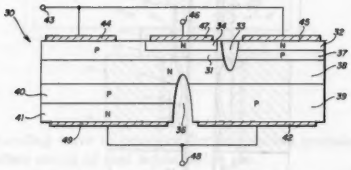
b. at least three electrodes in contact with outer surfaces of said body;

c. first means for physically and electrically isolating areas of one of said outer surfaces; and

d. second means having segments which bisect a plane through said first means for physically and electrically

isolating areas of a second of said outer surfaces so as to provide conduction of said device by the application of





any of four gating quadrant combinations to said electrodes.

3,972,015

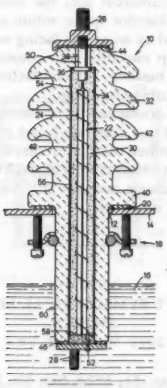
HEAT INSULATED FUSED HIGH VOLTAGE BUSHING

Harvey W. Mikulecky, Racine, Wis., assignor to RTE Corporation, Waukesha, Wis.

Continuation of Ser. No. 385,436, Aug. 3, 1973, abandoned. This application Feb. 12, 1975, Ser. No. 549,388

Int. Cl.² H01H *85/02*

U.S. Cl. 337—202 **5 Claims**



1. A fused high voltage bushing for connecting a high voltage cable to an electrical device housed within a casing, said bushing comprising

a housing formed of a ceramic dielectric material and having a passage,

an electric terminal at each end of said passage,

means for sealing said terminals to each end of said passage,

a fusible element within said passage electrically connected to each of said terminals,

a layer of conductive material on the inside surface of said passage,

means for connecting said layer to one of said terminals,

means within said passage for thermally insulating the surface of said passage from the heat generated on fusing of said element,

and a granular dielectric material completely filling the space between said insulating means and said fusible element.

3,972,016

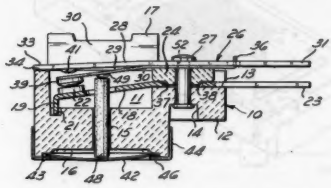
THERMOSTAT

Donald J. Schmitt, Mansfield, Ohio, assignor to Therm-O-Disc Incorporated, Mansfield, Ohio

Filed June 28, 1974, Ser. No. 483,924

Int. Cl.² H01H *37/52*

U.S. Cl. 337—354 **9 Claims**



1. A thermostat or the like comprising a body providing a switch cavity and a switch mounting portion on one side thereof, a switch including fixed contact means and movable contact means, said movable contact means including a movable contact and a terminal member, a single rivet securing both contact means to said body, said body and said contact means each providing interengaging locating surfaces substantially spaced from said rivet cooperating with said rivet to prevent relative movement between said body and contact means, and a condition-sensitive snap device mounted on said body and connected to operate said contact means, one of said contact means closing said cavity, and said interengaging locating surfaces being on the side of said cavity remote from said rivet one of said contact means including spring means prestressed by said rivets and operating to prevent looseness of said switch when a temperature of said thermostat changes, and said condition-sensitive snap device being a bimetal snap disc.

3,972,017

DC POTENTIAL CONTROLLER

John L. Dohanic, Jr., Girard, and Gerald J. Cornell, Lake City, both of Pa., assignors to Louis Marx & Co., Inc., Glen Dale, W. Va.

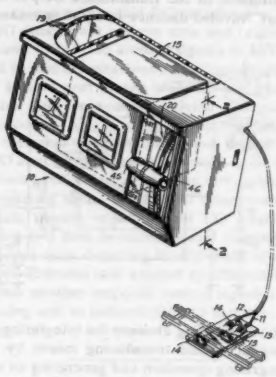
Filed July 22, 1975, Ser. No. 597,932

Int. Cl.² H01C *5/02*

U.S. Cl. 338—165 **10 Claims**

1. A D.C. potential controller comprising supply means adapted to have a D.C. potential having a predetermined polarity and magnitude applied thereto, said supply means including a first fixed terminal means referenced to said predetermined polarity and potential and a second fixed terminal means referenced to a reference potential, control means for producing a potential of varying magnitude and polarity, said control means including regulating means displaceable between a first and second polarity selecting position, said regulating means being coordinately displaceable from one of said first and second polarity selecting positions through a third position, said regulating means further including first and second moving contacts disposed thereon in spaced apart relationship, each of said moving contacts being electrically coupled to one of said first and second fixed terminals when said regulating means is coordinately displaced through said third position, and first and second output current means

disposed in contact with said moving contact means when same are displaced through said third position, said first output current means including means for linearly varying the current therein in response to said coordinate displacement of said regulating means through said third position.

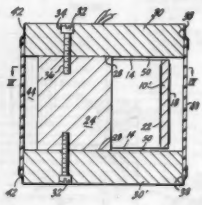


3,972,018

ELECTROMECHANICAL TRANSDUCER

David J. Erickson, Jackson, Mich., assignor to Sparton Corporation, Jackson, Mich.

Filed Aug. 10, 1972, Ser. No. 279,715
Int. Cl.[2] H04B *13/00*
U.S. Cl. 340—10 **4 Claims**



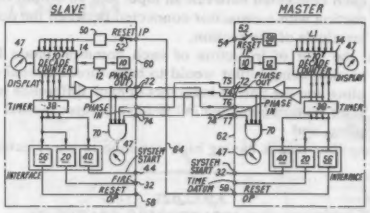
1. An electromechanical transducer utilizing an arcuate piezoelectric element vibrating in flexure comprising, in combination, a piezoelectric element of arcuate bowed configuration having an axis, a convex outer surface, a concave inner surface and spaced lateral edges defining the limits of the element's arcuate configuration, a mechanical rigid restraining member affixed to said element's edges restraining said edges from movement relative to each other and restricting movement of said element to flexure intermediate said edges, an electrode affixed to at least one of said surfaces for energizing said element to produce flexure thereof, said element and said restraining member defining an inner chamber having ends, end caps attached to said restraining member extending over said chamber ends, a flexible boot affixed to and extending between said end caps enclosing said element and restraining member defining an outer chamber within which said element and restraining member are encased, a fluid within said outer and inner chambers, and port means establishing communication between said outer and inner chamber.

3,972,019

TIME SYNCHRONIZATION

Edward James Bassett, Orpington, England, assignor to Seismograph Service Corporation, Tulsa, Okla.

Filed July 9, 1973, Ser. No. 377,718
Int. Cl.[2] G01V *1/22*
U.S. Cl. 340—15.5 TS **2 Claims**



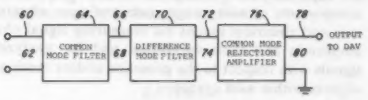
1. Apparatus for obtaining accurate time synchronisation at remote points without direct communication of the time between these points utilising separate timing units which can be used at separate points and which can be brought together at one point for synchronisation, wherein each of said units comprises a constant frequency oscillator for producing a time wave, a frequency divider in each unit comprising a counter having multiple stages for producing from the time wave in each respective unit time pulses at intervals of time which are the same in different units, and means for synchronising the time pulses of one unit with those of the other unit when the two units are brought together and connected to each other, said synchronising means including means in each unit for combining the outputs of a number of the stages of the counter of that unit, means for comparing the phases of the resulting time pulses of the two units when they are connected together and means for providing a visual indication of the relative phases of the time pulses of the two units, each unit including means for providing pulses after the units have been synchronised and while the units are at remote points and operating independently of each other to cause the units to produce signals which are accurately related in time with each other.

3,972,020

TRANSFORMERLESS INPUT FOR SEISMIC DATA ACQUISITION SYSTEM

Paul E. Carroll; Warren Moore, Jr., and William C. Voigt, all of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 11, 1974, Ser. No. 531,563
Int. Cl.[2] G01V *1/36*; H04B *3/28*
U.S. Cl. 340—15.5 AF **9 Claims**



1. In a data acquisition system having at least one transducer and wherein the signal produced by each of said transducers is coupled by a separate pair of wire lines to a data acquisition unit, the combination between each of said transducers and said data acquisition unit comprising:

a. filter means including a common mode filter and a difference mode filter,

i. said common mode filter further comprising at least one common mode filter section with differential input and output, said filter section having a first pair of magnetically coupled inductors each connected between an

input and an output of the section and a pair of capacitors connected in series between the outputs of the section with means for coupling the node between said pair of capacitors to a common reference potential,

ii. said difference mode filter further comprising at least one difference mode filter section with differential input and output and having a second pair of inductors each connected between an input and an output of the section with a capacitor connected between the output terminals of the section,

iii. the pair of inductors of each common mode filter section being bifilar would to have direct mutual coupling and the pair of inductors of each difference mode filter section being wound to have reverse mutual coupling, and

b. amplifier means having high common mode rejection.

3,972,021

SYSTEM FOR MONITORING SPACES BY ELECTRO-OPTICAL MEANS

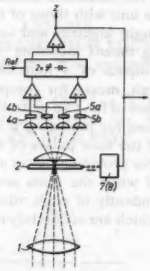
Ludwig Leitz, Laufdorferweg 33; Knut Heitmann, Lerchenweg 16, and Eckart Schneider, Lauerstr. 3, all of 633 Wetzlar, Germany

Filed May 21, 1975, Ser. No. 579,568

Claims priority, application Germany, May 27, 1974, 2425466

Int. Cl.² G08G *1/00*

U.S. Cl. 340—38 P **16 Claims**



1. In a system for monitoring spaces by electro-optical means, the improvement comprising:

optical imaging means (1) for detecting objects present in said spaces to be monitored and beam splitting means (2) for grating-resolution of images of said objects into geometric, mutually complementary components, said imaging and beam splitting means defining an imaging correlation sensor system having photoelectric detectors (4, 5) for separately converting light fluxes corresponding to components of said images into analogue electrical signals and electrical means for measuring signal phase and amplitude and their variations, and for analyzing said signals with respect to the presence and/or motion of said objects within said spaces.

3,972,022

INDICATOR OF VEHICLE SERVICE INTERVALS

Kenji Goto, and Norio Shibata, both of Shizuoka, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

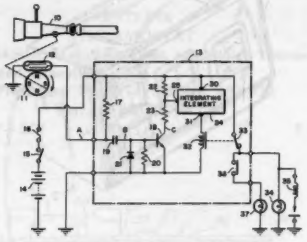
Filed Nov. 4, 1974, Ser. No. 520,892

Claims priority, application Japan, Nov. 5, 1973, 48-124262; Feb. 1, 1974, 49-13446

Int. Cl.² G01C *22/02*

U.S. Cl. 340—52 D **16 Claims**

1. An indicator for detecting and displaying the arrival of the time limit at which inspection and reconditioning of a vehicle must be carried out, comprising transducing means having a magnet rotatively driven by an output shaft of a transmission and a reed switch disposed in close proximity to the magnet, the reed switch being alternately closed and opened with the rotation of said magnet to transduce the number of rotations of the transmission output shaft into a distance signal, traveled distance integrating means including



an electrolytic integrating element for integrating the electrical output signal of said transducing means by an electrochemical integrating operation and generating an alarm signal when the integrated amount of said applied input attains a predetermined value, and display means for performing an alarm displaying operation in response to the application of the alarm signal from said electrolytic integrating element.

3,972,023

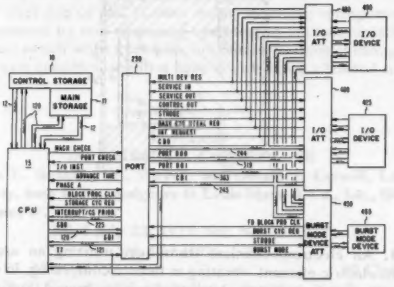
I/O DATA TRANSFER CONTROL SYSTEM

Ronald E. Bodner; Mario N. Cianciosi; Thomas L. Crooks, all of Rochester, Minn.; Israel B. Magrisso, Coral Springs, Fla.; Keith K. Slack, Rochester, Minn., and Richard S. Smith, Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1974, Ser. No. 537,471

Int. Cl.² G06F *3/00*

U.S. Cl. 340—172.5 **71 Claims**



1. In a computer system having storage for storing instructions including I/O instructions, a central processing unit including means for fetching and decoding instructions, local storage register means for storing address data and control data, port means connected to said central processing unit, I/O attachments connected to said port means and I/O devices connected to said I/O attachments, the improvement comprising:

means within said central processing unit for transferring to said port means an I/O instruction retrieved from said storage and address data retrieved from said local storage register means,

means within said port means responsive to receiving said I/O instruction and said address data for forming a command and I/O attachment address data and simulta-

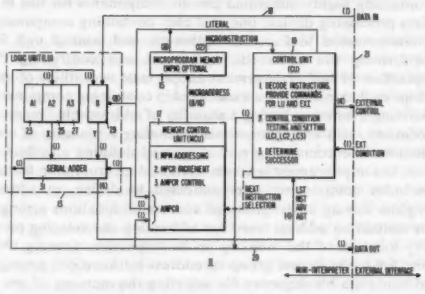
neously transmitting to said I/O attachments said formed command and I/O attachment address data together with a synchronizing signal indicating to said I/O attachments that said command and I/O attachment address data should be decoded, and

response means within said I/O attachments for decoding said I/O attachment address data and responding to said command to provide control signals to I/O devices connected to said I/O attachments and generating a response signal to said port means whereby said port means deactivates said synchronizing signal and generates a response control signal to said central processing unit to cause the same to provide said port means with data for said I/O attachments, said port means upon receiving said data from said central processing unit generates another synchronizing signal to said I/O attachments and sends said data thereto whereby said I/O attachments upon receiving said data de-activates said response signal, said port means upon detecting de-activation of said response signal de-activates said another synchronizing signal and generates another response control signal to said central processing unit to indicate thereto that execution of said I/O instruction is complete.

3,972,024
PROGRAMMABLE MICROPROCESSOR

Franklin T. Schroeder, Exton, and John P. McAllister, Wayne, both of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Mar. 27, 1974, Ser. No. 455,060
Int. Cl.² G06F 9/20, 9/16
U.S. Cl. 340—172.5 **5 Claims**



1. In a microprocessing apparatus for cyclically processing microinstructions addressably stored in a microprogram memory means, certain ones of said microinstructions including address bits, the improvement comprising:

an incrementable first register for storing address bits to addressably select microinstructions for retrieval from said microprogram memory means;

a second register for storing address bits loadable into said first register;

means, responsive to address bits stored in said first register and operative during a single process cycle, for retrieving from said microprogram memory means a selected one of said certain ones of said microinstructions and loading the address bits included therein into said second register;

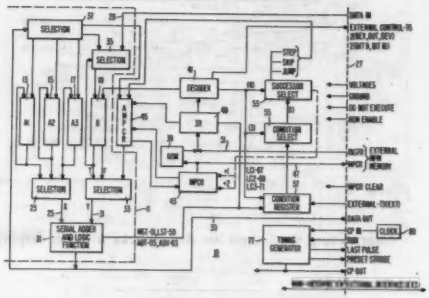
means for incrementing within said single process cycle the contents of said first register; and

means for swapping within said single process cycle said incremented contents of said first register and said loaded address bits in said second register.

3,972,025
EXPANDED MEMORY PAGING FOR A PROGRAMMABLE MICROPROCESSOR

Vincent J. Taddei, West Chester, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Sept. 4, 1974, Ser. No. 503,112
Int. Cl.² G06F 9/16, 13/00
U.S. Cl. 340—172.5 **7 Claims**



1. An expanded memory microprocessing system comprising:

a plurality of microprogram memory pages, each page therein for storing a plurality of addressable microinstructions;

a microprogrammable microprocessor for sequentially executing microinstructions, said microprocessor having

a single address register of size sufficient to address only a single microprogram memory page,

means for designating a particular microprogram memory page in said plurality of pages, and

an instruction register for receiving microinstructions prior to the executing thereof;

means connecting said plurality of memory pages with said address register for addressing in parallel all pages in said plurality of pages;

means external to said microprocessor and responsive to said designating means for enabling said particular page designated thereby; and

means for fetching an addressed microinstruction from an enabled page and for transferring said addressed microinstruction to said instruction register.

3,972,026
LINKED LIST ENCODING METHOD AND CONTROL APPARATUS FOR REFRESHING A CATHODE RAY TUBE DISPLAY

Thomas Frank Waltman, Mountain View, and Richard Ricker Lyman, Palo Alto, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

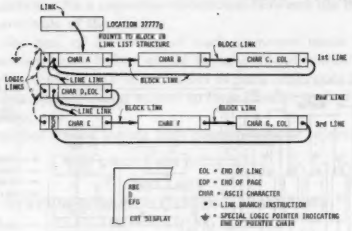
Filed Sept. 23, 1974, Ser. No. 508,600
Int. Cl.² G06F 3/14
U.S. Cl. 340—172.5 **24 Claims**

1. A display refresh method comprising the steps of:

encoding data representing figures to be displayed as data characters;

encoding data representing enhancement features and execution path instructions as control characters;

combining the data and control characters to form linked list data blocks; and



interpreting the linked list data blocks to form displayable lines.

3,972,027

SKEW COMPENSATION FOR A MAGNETIC CARD READING-WRITING UNIT

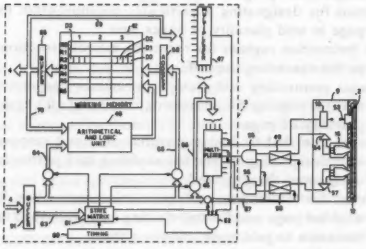
Gastone Garziera, Ivrea (Turin), Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Filed Dec. 6, 1974, Ser. No. 530,315

Claims priority, application Italy, Dec. 28, 1973, 70878/73

Int. Cl.² G06F *11/00*; G11B *5/09*; G06F *13/04*

U.S. Cl. 340—172.5 **7 Claims**



1. In an electronic computer: a central processing unit; an information storing memory; a reading-writing unit for reading from and writing information on a magnetic card in form of bits distributed along a pair of magnetized tracks and including means for simultaneously writing one reference signal of a pair of reference signals on each of said tracks; means for transferring the formation between the reading-writing unit and the memory; and delay compensation means responsive to the reading of said pair of reference signals to control the means for transferring to compensate for any introduced delay to transfer said information to said memory in the order it was written.

3,972,028

DATA PROCESSING SYSTEM INCLUDING A PLURALITY OF MEMORY CHIPS EACH PROVIDED WITH ITS OWN ADDRESS REGISTER

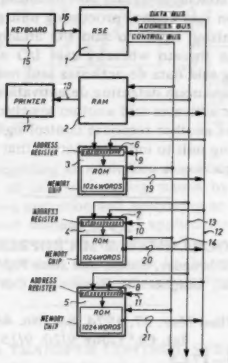
Gerald Weber, and Jurgen Sorgenfrei, both of Braunschweig, Germany, assignors to Olympia Werke AG, Wilhelmshaven, Germany

Filed Dec. 20, 1974, Ser. No. 535,089

Claims priority, application Germany, Dec. 22, 1973, 2364408

Int. Cl.² G06F *13/00*

U.S. Cl. 340—172.5 **6 Claims**



1. In a circuit arrangement composed of a plurality of chips containing highly integrated circuit components for use in a data processing device, one said chip containing components interconnected to form an arithmetic and control unit for performing the arithmetic operations and controlling the operation of said arrangement and at least two others of said chips each constituting a memory chip containing components defining a memory having a plurality of addressable "memory locations, said arrangement also including a plurality of conductors interconnecting said chips and defining a collecting bus, the improvement wherein each said memory chip further includes components interconnected to define an address register having a first group of address bit locations arranged to contain an address word for addressing any selecing memory location of the memory on its respective memory chip, and having a second group of address bit locations arranged to contain a bit sequence for selecting the memory of one of said memory chips for read-out, there being a respective bit sequence corresponding to ach said memory chip, and each said register having a counting pulse input and being arranged to count through successive memory word addresses in response to pulses applied to its counting pulse input.

3,972,029

CONCURRENT MICROPROCESSING CONTROL METHOD AND APPARATUS

Myrl Kennedy Bailey, Jr., North Billerica, Mass., assignor to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Dec. 24, 1974, Ser. No. 536,126

Int. Cl.² G06F *9/18*

U.S. Cl. 340—172.5 **25 Claims**

1. A peripheral controller coupled to a first interface for receiving bytes from a processing system and coupled to a second interface for transferring said received bytes to an output device, said controller comprising:

an addressable control store including a plurality of addressable locations for storing microinstructions of an initial sequence and microinstructions of at least two microprograms including microinstructions for generating signals

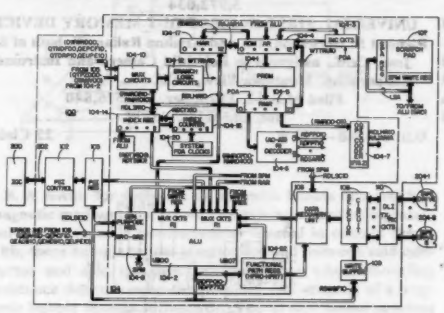
for receiving and transferring bytes from said first and second interfaces;

an address register connected to said store for storing an address for accessing said locations;

an output register coupled to said store for temporarily storing the microinstruction contents of an accessed location during a cycle of operation;

an auxiliary register coupled to said output register and to said address register; and,

decoder means coupled to said output register for generating control signals in response to decoding microinstructions read out into said output register, said decoder means including first means operative upon the read out of a predetermined one of said microinstructions contained in said initial sequence to generate a first one of said control signals for loading said auxiliary register with signals corresponding to a constant field included in said predetermined one of said microinstructions, said constant field of said predetermined one of said microinstructions being coded to specify a location of a microinstruc-



tion in one of said microprograms, said address register being conditioned by a first type of branch microinstruction in said initial sequence to load said address register with an address to branch said control store to a microinstruction stored in an initial location within the other microprogram and said decoder means further including second means operative during a cycle of operation upon read out of a predetermined one of said microinstructions contained in said other microprogram to generate a second one of said control signals for loading said address register with the contents of said auxiliary register and said first means generating said first control signal during a next cycle of operation upon read out of a next microinstruction stored in the next location of said other microprogram for again loading said auxiliary register with signals corresponding to another constant field included in said next microinstruction read out into said output register, said constant field of said next microinstruction being coded to specify a return location of a microinstruction in said other microprogram.

3,972,030

PERIPHERAL CONTROL CAPABLE OF DYNAMICALLY EXECUTING COMMAND SEQUENCES

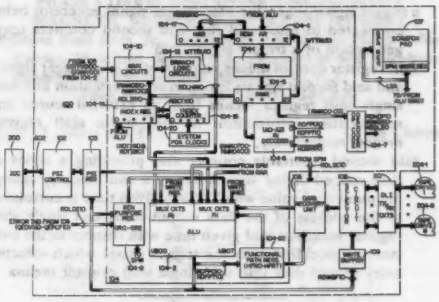
Myrl Kennedy Bailey, Jr., North Billerica, Mass., assignor to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Jan. 2, 1975, Ser. No. 537,993
Int. Cl.² G06F 9/16
U.S. Cl. 340—172.5 **23 Claims**

1. A peripheral controller operative to control a plurality of input/output devices in response to command byte signals received from a processing system, said controller comprising:

an addressable control store having a plurality of storage locations for storing a plurality of microprogram routines independently used to execute different input/output operations in response to different codings of said command byte signals, each of said microprogram routines including a plurality of microinstructions having a predetermined sequence of microinstructions, said control store including decoder means for generating control signals in response to microinstructions read out from said control store;

addressable storage means operatively coupled to said control store, said storage means including a plurality of locations for storing status and control information signals used in performing said input/output operations, a predetermined one of said storage locations for storing in response to a command specified by said command byte signals a bit pattern coded for indicating when said con-



troller is executing a series of operations requiring execution of a plurality of said microprogram routines; and,

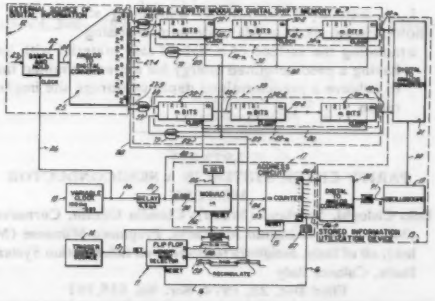
processing means coupled to receive signals from said control store, said decoder means and said storage means, said processing means being operative in response to control signals generated by said decoder means in response to said predetermined sequence of microinstructions to access said coded bit pattern contents from said predetermined location of said storage means and test the value of said bit pattern for determining when said controller is executing said series of operations in response to said command.

3,972,031

VARIABLE LENGTH SHIFT REGISTER ALTERNATELY OPERABLE TO STORE AND RECIRCULATE DATA AND ADDRESSING CIRCUIT THEREFOR

Don H. Riemenschneider; William L. Townsend, and Joseph W. Pehoushek, all of Cincinnati, Ohio, assignors to Zonic Technical Laboratories, Inc., Cincinnati, Ohio

Filed Aug. 15, 1974, Ser. No. 497,757
Int. Cl.² G11C 13/00
U.S. Cl. 340—173 R **15 Claims**



1. A digital information storage system having a storage capacity of c bits selectively variable in multiples of m and nm bits, where c, n and m are integers, said system comprising:

n m-bit digital shift registers,

variable connection means to interconnect one or more of said m-bit shift registers in cascade to produce a single

shift register means having an effective bit storage capacity of c bits which is selectively variable between m bits and nm bits in multiples of m bits,

a sample signal generator for producing sample signals at a predetermined sampling frequency, said sample signals being input to said single shift register means to shift bits therein at said sampling frequency,

a first resettable counter means responsive to said sample signals for providing a first signal for every c/m sample signals input thereto,

a second resettable counter responsive to said first signals for providing a second signal for every m first signals input thereto,

a trigger signal generator, said trigger signal generator being connected to reset said first and second counters upon generation of a trigger signal, and

shift register control means responsive to said trigger signals and said second signals for entering information into said single shift register means from an external source and recirculating information in said single shift register means, respectively,

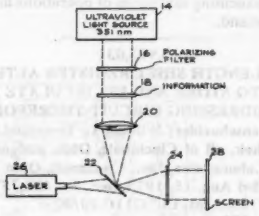
said second resettable counter also providing a series of time-spaced digital signals having a continuously changing numerical value which at any given time is correlated to the address of the data output from said single shift register means at said given time with respect to the data stored coincident with the trigger signal which effected entry of said data into said single shift register means.

3,972,032

MEMORY SYSTEM USING ION IMPLANTED PHOTODICHROIC MATERIALS

Thomas J. Magee, Belmont, and Matt Lehmann, Menlo Park, both of Calif., assignors to Stanford Research Institute, Menlo Park, Calif.

Filed Sept. 9, 1974, Ser. No. 504,058
Int. Cl.² G11C *11/42, 13/04*
U.S. Cl. 340—173 CC **6 Claims**



1. A method of controllably implanting storage sites in photodichroic alkali halide material comprising

irradiating the surface of a slab of said material with ions having a predetermined energy for a predetermined time to achieve a predetermined depth of storage site implantation.

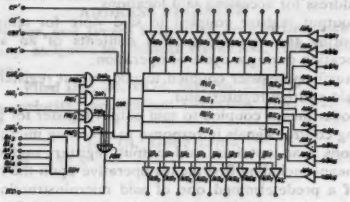
3,972,033

PARITY CHECK SYSTEM IN A SEMICONDUCTOR MEMORY

Ezio Cislaghi, Sedriano (Milan); Claudio Gentili, Cornaredo (Milan), and Ermanno Maccario, Pregnana Milanese (Milan), all of Italy, assignors to Honeywell Information Systems Italia, Caluso, Italy

Filed Dec. 23, 1974, Ser. No. 535,751
Claims priority, application Italy, Dec. 27, 1973, 32158/73
Int. Cl.² G11C *7/00, 29/00*
U.S. Cl. 340—173 R **7 Claims**

4. A semiconductor memory, comprising:a plurality of circuit sections; means for recording different portions of an information word on different circuit sections; and means for recording a check bit for each of said different portions of said



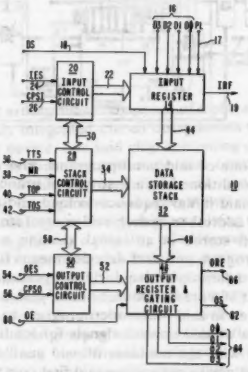
information word on a one of said circuit sections other than the circuit section upon which the corresponding portion of said information word is recorded.

3,972,034

UNIVERSAL FIRST-IN FIRST-OUT MEMORY DEVICE

Richard B. Derickson, III, and Krishna Rallapalli, both of San Jose, Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed May 12, 1975, Ser. No. 576,840
Int. Cl.² G11C *13/00*
U.S. Cl. 340—173 R **22 Claims**



1. A single chip large scale integration device having a set of data input pins, a set of data output pins, and control signal input pins, of a first-in first-out memory, comprising:

a. input means having control input terminals, data input terminals coupled to the data input pins of said device, and data output terminals, said input means being disposed for accepting data from an outside source on said data input pins;

b. a data storage means having data input terminals coupled to said data output terminals of said input means and having data output terminals, said data storage means comprising an asynchronous circuit having a multiplicity of sets of individual storage devices and each of said sets of individual storage devices being adapted for accepting data only when in a neutral state;

c. output means having control input terminals, data input terminals coupled to said data output terminals of said storage means, and data output terminals coupled to the data output pins of said device; and

d. circuit means having input terminals coupled to the control signal input pins of said device, and output terminals coupled to said control input terminals of said input and output means for independently controlling the loading of

data into an extraction of data from said memory, whereby data loaded into said input means asynchronously flows through said data storage means as a function only of data extracted from said output means.

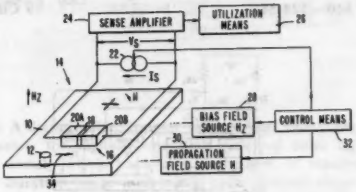
3,972,035
DETECTION OF MAGNETIC DOMAINS BY TUNNEL JUNCTIONS

Frederic Holtzberg, Pound Ridge; Ashok F. Mayadas, Somers; William A. Thompson, Yorktown Heights, and Stephan von Molnar, Ossining, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 265,943, June 23, 1972, Pat. No. 3,840,865. This application Apr. 2, 1974, Ser. No. 457,324

Int. Cl.² G11C *11/14*

U.S. Cl. 340—174 TF **8 Claims**



8. A sensor for detection of magnetic bubble domains in a magnetic medium, said sensor comprising a conducting material and a magnetic semiconductor located in contact therewith, there being a tunnel junction formed between said conductor and said magnetic semiconductor whose tunneling resistance depends upon the presence and absence of a magnetic bubble domain sufficiently close to said tunnel junction that the stray magnetic field associated with said domain will intercept said tunnel junction.

3,972,036
ARRANGEMENT FOR RAPID SWITCHING OF A HIGH FREQUENCY MAGNETIC FIELD

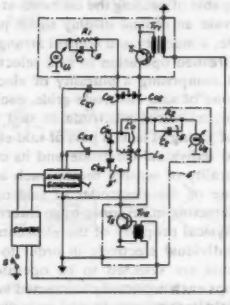
Franz Navratil, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Apr. 8, 1974, Ser. No. 458,754

Claims priority, application Germany, Apr. 12, 1973, 2318530

Int. Cl.² G11C *11/14*; H03F *3/55*

U.S. Cl. 340—174 TF **6 Claims**



1. An arrangement for rapidly switching on and off a high frequency rotary magnetic field, comprising: a pair of crossed coils; high frequency generating means connected to said coils and feeding said coils a sine-shaped current which is out of phase by 90° at one coil with respect to the other, a separate capacitance connected across each of said coils to form respective parallel resonant circuits, and a pair of switching circuits connected in parallel to respective ones of said resonant circuits, each of said switching circuits comprising a controllable voltage source, a timing circuit connecting said controllable voltage source to one end of the respective parallel resonant circuit and a switch connecting the other end of the respective parallel resonant circuit to a reference potential.

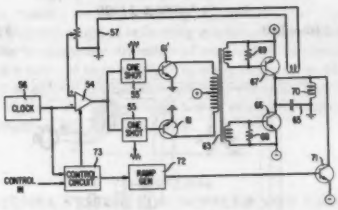
3,972,037
PHASE CORRECTING DRIVE CIRCUIT FOR A MAGNETIC BUBBLE FIELD-ACCESS MEMORY

William Emil Hess, Jr., Piscataway, and George Philip Vella-Coleiro, Plainfield, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 30, 1975, Ser. No. 591,820

Int. Cl.² G11C *11/14*

U.S. Cl. 340—174 TF **10 Claims**



5. A magnetic bubble memory arrangement comprising a circuit for regulating the phase of the current in a tuned circuit with respect to a clock signal, said circuit comprising pulse generating means responsive to said clock signal and a timing control signal for providing refresh pulses to said tuned circuit, and feedback means coupled to said tuned circuit and being adapted for applying to said pulse generating means a timing control signal in phase with the current in said tuned circuit for providing said refresh pulses in phase with said current.

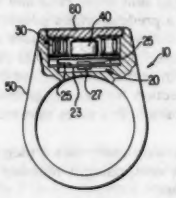
3,972,038
ACCELEROMETER TELEMETRY SYSTEM

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Eph Konigsberg, Sierra Madre, Calif.

Filed Mar. 28, 1975, Ser. No. 563,049

Int. Cl.² G08C *19/16*

U.S. Cl. 340—189 M **6 Claims**



1. A miniaturized accelerometer telemetry system for monitoring the hand movements of a subject comprising:

an accelerometer for detecting accelerational movements and for producing an electrical output signal in accordance therewith;

transmitter means;

modulator means for modulating the output of said transmitter with the output signal produced by said accelerometer;

a housing, adapted to be worn on the person, for housing said accelerometer, said transmitter means and said modulator means;

said accelerometer comprising an annular ring and a central support beam extending diametrically across said ring, a seismic mass affixed to said beam at the center of said ring so as to permit axial movements of said seismic mass, and first and second semiconductor strain gages, bonded to said beam on opposite sides of said mass, the electrical resistance of said gages varying in relationship to the stresses endured in each of said beams.

3,972,039

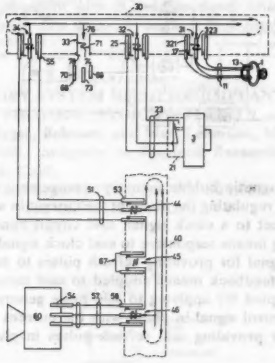
ARTICLE REMOVAL AND PILFERAGE DETECTION SYSTEM AND APPARATUS

Steven Grant Marshall, 143 Village of Nagog Woods, Acton, Mass. 01718

Filed Mar. 14, 1974, Ser. No. 451,049

Int. Cl.² G08B *21/00*

U.S. Cl. 340—280 **3 Claims**



1. An alarm system to respond to the removal of a treasure from its assigned place, comprising:

a. an indicator subsystem containing a signal transmitter;

b. distributing means including at least three runs of wire extending from said subsystem to said treasure, and terminations of said runs such that a circuit of current is maintained from said subsystem outward along a first of said runs, and back to said subsystem along a second of said runs, and such that said third run extends with at least one of said other runs and is isolated therefrom to maintain a predetermined potential difference;

c. wherein said subsystem incudes detection circuit means so connected that cutting said circuit causes said transmitter to transmit an alarm, and so that making an electrical connection between said third run and said circuit even momentarily causes said transmitter to transmit an alarm;

d. said subsystem comprises a plug-in strip;

e. said strip comprising a plurality of identical connector receptacles;

f. each of said receptacles having three sockets for mating plug having three pins;

g. each of said receptacles having a spring to maintain the interconnection of two of said sockets until said pins are inserted, said spring being deflected by the outward motion of one of said pins upon withdrawal to make connection between one of said two and the third of said sockets;

h. wherein each of said two sockets is electrically connected to one and only one of said two sockets of another of said receptacles; and

i. wherein all of said third sockets are electrically interconnected each to all of the others.

3,972,040

DISPLAY SYSTEMS

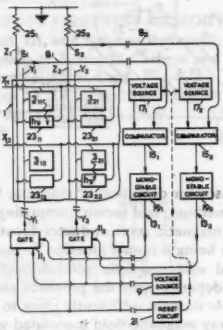
Cyril Hilsum, Malvern, and Adrian Leonard Mears, Leckhampton, near Cheltenham, both of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Aug. 12, 1974, Ser. No. 496,716

Claims priority, application United Kingdom, Aug. 15, 1974, 38635/73

Int. Cl.² G08B *5/36*

U.S. Cl. 340—324 M **9 Claims**



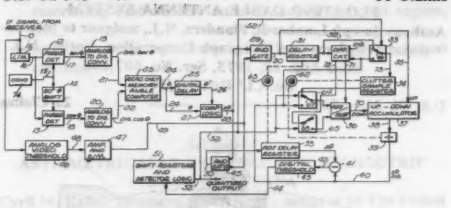
1. A refreshed display system incorporating electro-optic display elements capable of electrically latching the elements into a fixed state, said system comprising a matrix of said elements arranged in rows and columns, a grid of row electrodes each associated with a corresponding one of said rows and each connected to the elements in its corresponding row, a grid of column electrodes each associated with a corresponding one of said columns and each connected to the elements in its corresponding column, said elements being at intersections between said row and column electrodes, means for generating a pulsed operating signal having a refreshing cycle and capable of causing the elements at selected intersections to provide an otpical display signal pulse once per refreshing cycle, a memory and control arrangement capable of providing refreshed operation of said selected elements, said arrangement comprising a plurality of electrical gates associated with one of said electrode grids, each gate being connected to an individual electrode in said grid and capable when open of gating at least a part of said electrical operating signal to said individual electrode and its corresponding elements, a plurality of sensing means each associated with an individual one of the electrodes of said one grid and each capable of detecting in response to an interrogation signal the state of a physical property of the elements connected to its associated individual electrode in order to indicate whether those elements are selected to be operated, a plurality of feedback loops each separately connected between an individual one of said sensing means and an individual one of said gates and means for applying to each of the electrodes of the other of said electrode grids an interrogation signal once per refreshing cycle to cause each of said sensors to open its associated gate whenever it detects said physical property to indicate selection of an element.

3,972,041

ADAPTIVE CLUTTER VELOCITY CANCELLATION SYSTEM FOR PULSED DIGITAL MTI SYSTEM

Shirly L. Howard, Canoga Park, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 125,257, March 17, 1971, abandoned. This application Feb. 25, 1975, Ser. No. 552,926
Int. Cl.² G01S 9/42
U.S. Cl. 343—7.7 11 Claims



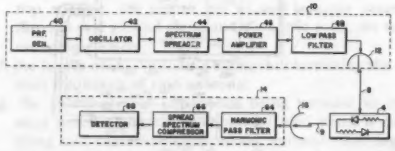
1. A digital pulse Doppler radar system comprising:
means for digitally encoding received echo signals discretely within each of a succession of relatively short duration range increments each of fixed range position within successive repetition periods of said radar system, said means encoding said signals to have digital magnitudes which are a function of the instantaneous Doppler phase angle of received signals in each of said range increments;
means for differencing said digitally encoded signals between adjacent pulse repetition periods to cancel signals exhibiting substantially no echo signal phase change;
means for sampling a predetermined band of said range increments during successive pulse repetition periods to determine an average velocity factor as a function of the average moving signal velocity over said band;
and means responsive to said average factor and to the individual signal velocities for producing a quantized output during each range increment in which a signal velocity varies from said average moving target velocity within said band.

3,972,042

METAL TARGET DETECTION SYSTEM

Robert H. Johnson, Scottsdale, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed Dec. 2, 1974, Ser. No. 528,828
Int. Cl.² G01S 9/233
U.S. Cl. 343—17.2 PC 8 Claims



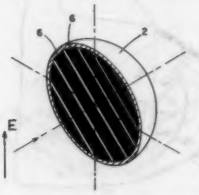
1. A metal detection system comprising:
means for radiating a spread spectrum signal to a metal target having a non-linear electrical response characteristic, said target radiating a harmonic signal in response to said spread spectrum signal;
means for receiving the harmonic signal; and
means for compressing and detecting the harmonic signal.

3,972,043

CROSS-POLARIZING LENS REFLECTOR

Silvan Stanley Locus, Van Nuys, Calif., assignor to Northrop Corporation, Los Angeles, Calif.

Filed Feb. 3, 1975, Ser. No. 546,692
Int. Cl.² H01Q 15/22
U.S. Cl. 343—18 B 6 Claims



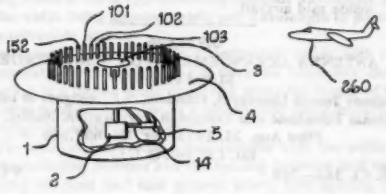
6. A passive cross-polarizing radar reflector comprising spaced parallel strips of reflecting material placed perpendicular to the propagation direction of an incident electromagnetic wave, the ratio of strip width to spacing being from about 12:1 to 13:1 to give a desired fraction of cross-polarization in the return signal, the strip width being small compared to the wavelength of the incident wave.

3,972,044

ANTENNA SYSTEM FOR DOPPLER VOR GROUND STATIONS

Andrew Alford, 120 Cross St., Winchester, Mass. 01890

Filed Apr. 8, 1974, Ser. No. 459,068
Int. Cl.² G01S 1/38
U.S. Cl. 343—106 D 6 Claims



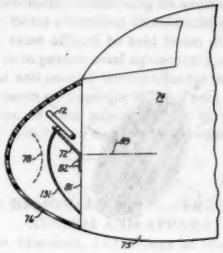
1. A radiating antenna system, radiating horizontally polarized waves comprising means providing a conductive horizontal elevated sheet of limited dimensions,
A. First radiating means centrally located with respect to said conductive sheet, said radiating means having a substantially omnidirectional radiation pattern and radiating a first frequency,
B. First transmitter means for energizing said first radiating means,
C. Second omnidirectional radiating means, comprising a plurality of directional antennas arranged on the conducting sheet around the first means, each oriented to radiate maximum radiation toward the first radiating means, said second means radiating a second frequency,
D. Second transmitter means for sequentially energizing said second radiating means,
E. Whereby the radiation center of said second radiating means effectively moves around said first omnidirectional radiation means.

3,972,045

AIRCRAFT WITH TELEVISION SYSTEM

Ludwig A. Perret, La Canada, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed May 20, 1974, Ser. No. 471,253
Int. Cl.[2] H01Q 1/28
U.S. Cl. 343—705 4 Claims



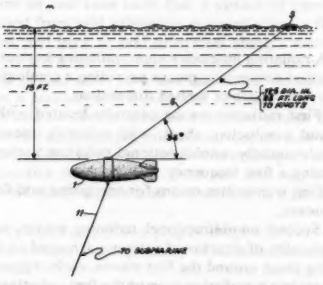
1. Apparatus for entertaining passengers in an aircraft, comprising in combination:
- a rotary supporting structure including an essentially circular sheet;
- means connected to said aircraft and to said rotary supporting structure for mounting said rotary supporting structure in said aircraft;
- a set of antenna elements located on said circular sheet and constituting a directional television broadcast receiving antenna on said rotary supporting structure for receiving transmitted television signals;
- means for selectively changing the orientation of said directional television antenna, including means coupled to said supporting structure for selectively rotating said supporting structure and means coupled to said supporting structure for selectively tilting said supporting structure relative to a horizontal plane through said aircraft; and
- means connected to said directional television antenna for processing and displaying said received television signals inside said aircraft.

3,972,046

ANTENNA ARRANGEMENT FOR A SUBMERGED SUBMARINE

Anthony Joseph Lombardi, Flanders, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Aug. 25, 1975, Ser. No. 607,640
Int. Cl.[2] H01Q 1/32
U.S. Cl. 343—709 9 Claims



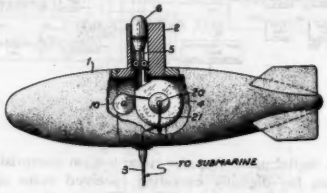
1. An antenna arrangement for a submerged submarine comprising:
- a primary buoy;
- a first electro-mechanical cable connecting said primary buoy to said submarine;
- a secondary buoy carrying an antenna;
- a second electro-mechanical cable having one end thereof connected to said secondary buoy and said antenna; and
- a system contained within said primary buoy connected to the other end of said second cable to automatically control the deploying and the retrieving of said secondary buoy and to provide electrical continuity between said first and second cables.

3,972,047

FLOATING CABLE ANTENNA SYSTEM

Anthony Joseph Lombardi, Flanders, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Aug. 25, 1975, Ser. No. 607,168
Int. Cl.[2] H01Q 1/34
U.S. Cl. 343—709 22 Claims



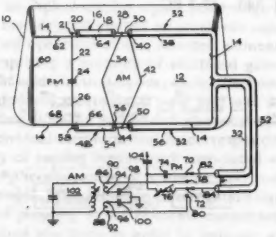
1. A floating cable antenna system for a submerged submarine comprising:
- a buoy;
- an electro-mechanical cable connecting said buoy to said submarine;
- an inflatable buoyant cable having a pressure accumulator containing a medium under a given pressure attached to one end of said buoyant cable adjacent the outer surface of said buoy;
- a cable reel disposed in said buoy to store said buoyant cable, the other end of said buoyant cable being attached to said cable reel; and
- an arrangement in said buoy associated with said buoyant cable and said cable reel to assist in deploying and retrieving said buoyant cable, said deploying and retrieving of said buoyant cable being under the control of sea pressure acting on said buoyant cable.

3,972,048

FM-AM WINDSHIELD ANTENNA

Ross Alan Davis, 724 Ala Moana Blvd., Honolulu, Hawaii 96813

Filed Nov. 29, 1974, Ser. No. 527,954
Int. Cl.[2] H01Q 1/32
U.S. Cl. 343—712 8 Claims



1. A vehicle body antenna system, including:
- a window opening in said body, said opening having a conductive perimeter and being responsive to radio frequency fields in first and second spectral regions, respectively, to produce, between points along said perimeter, signal potentials corresponding to said fields;

said perimeter having a length greater than a resonant fraction of a wavelength at frequencies in said first spectral region and being small in relation to a resonant fraction of a wavelength in said second spectral region;

framing means including an electrical conductor and a series connected capacitor shunting a portion of the conductive perimeter for reducing, at frequencies in said first spectral region, the effective length of said perimeter;

conductive means medially located across said window for resonating said window in said second spectral region; and,

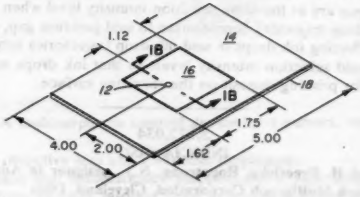
coupling means across said window for coupling to external circuits.

3,972,049

ASYMMETRICALLY FED ELECTRIC MICROSTRIP DIPOLE ANTENNA

Cyril M. Kaloi, Thousand Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 24, 1975, Ser. No. 571,158
Int. Cl.² H01Q 1/38
U.S. Cl. 343—829 **11 Claims**



1. An asymmetrically fed electric microstrip dipole antenna having low physical profile and conformal arraying capability, comprising:

a. a thin ground plane conductor;

b. a thin rectangular radiating element spaced from said ground plane;

c. said radiating element being electrically separated from said ground plane by a dielectric substrate;

d. said radiating element having a feed point located along the centerline of the length thereof;

e. said radiating element being fed from a coaxial-to-microstrip adapter, the center pin of said adapter extending through said ground plane and dielectric substrate to said radiating element;

f. the length of said radiating element determining the resonant frequency of said antenna;

g. the antenna input impedance being variable to match most practical impedances as said feed point is moved along said centerline between the antenna radiating element center point and the end of the radiating element in either direction without affecting the antenna radiation pattern;

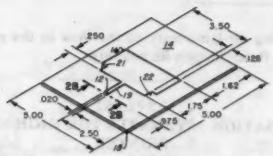
h. the antenna bandwidth being variable with the width of the radiating element and the spacing between said radiating element and said ground plane, said spacing between the radiating element and the ground plane having somewhat greater effect on the bandwidth than the element width.

3,972,050

END FED ELECTRIC MICROSTRIP QUADRUPOLE ANTENNA

Cyril M. Kaloi, Thousand Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 24, 1975, Ser. No. 571,156
Int. Cl.² H01Q 1/38
U.S. Cl. 343—846 **6 Claims**



1. An end fed electric microstrip quadrupole antenna having low physical profile and conformal arraying capability, comprising:

a. a thin ground plane conductor;

b. a thin rectangular radiating element spaced from said ground plane;

c. said radiating element being electrically separated from said ground plane by a dielectric substrate;

d. said radiating element having a feed point located at the end of the length on the centerline thereof;

e. said radiating element being fed from a coaxial-to-microstrip adapter, the center pin of said adapter extending through said ground plane and dielectric substrate to said radiating element;

f. the length of said radiating element determining the resonant frequency of said antenna; the length of said radiating element being approximately one-half wavelength and the width being approximately one wavelength to provide quadrupole action;

g. said antenna operating in a degenerate mode with two oscillation modes occurring at the same frequency, oscillation in a dipole mode occurring along the length of the element and oscillation in a quadrupole mode occurring along the width of the element;

h. the antenna bandwidth being variable with the width of the radiating element and the spacing between said radiating element and said ground plane, said spacing between the radiating element and the ground plane having somewhat greater effect on the bandwidth than the element width.

3,972,051

AIR TURBULENCE CONTROL OF INFLIGHT INK DROPLETS IN NON-IMPACT RECORDERS

David E. Lundquist; Arvin D. McGregor, both of Birmingham, Mich., and Paul R. Hoffman, Exton, Pa., assignors to Burroughs Corporation, Detroit, Mich.

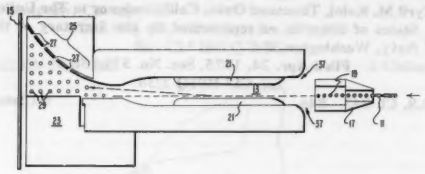
Filed Oct. 24, 1975, Ser. No. 625,811
Int. Cl.² G01D 15/18
U.S. Cl. 346—1 **14 Claims**

13. A method of eliminating air disturbance effects on ink droplets which are directed onto a moving print medium in an ink jet printer, comprising the steps of:

passing a laminar flow of air collinear with droplet travel relative to the print medium of sufficient velocity to reduce relative air velocity of the droplets;

slowing the laminar flow of air in the proximity of the print medium;

turning the laminar flow of air away from the print medium in the region where the air flow slows; and



maintaining air laminarity of the flow in the region where the air flow changes its velocity.

3,972,052

COMPENSATION APPARATUS FOR HIGH SPEED DOT PRINTER

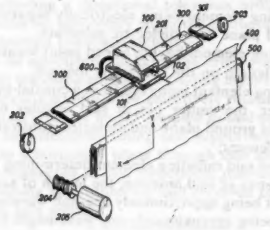
Shiro Atumi, Mitaka, and Kozo Yamada, Hachioji, both of Japan, assignors to Oki Electric Industry Company, Ltd., Tokyo, Japan

Filed Oct. 24, 1973, Ser. No. 409,289

Claims priority, application Japan, Dec. 28, 1972, 47-130205; Oct. 24, 1972, 47-105834

Int. Cl.² G01D *15/18*

U.S. Cl. 337 **5 Claims**



1. Compensation means for a printing apparatus which prints symbols formed by electrically charged ink dots deposited on a printing medium, said charged ink dots selectively being deflected to form said symbols, said printing apparatus comprising a nozzle means to supply ink to form an ink stream which is ejected onto said printing medium, means for splitting said ink stream into ink drops of uniform size having an equal spacing therebetween, charging means receiving voltage for charging said ink drops, at least a pair of main electrostatic deflection plates receiving a periodic voltage to deflect said charged ink drops in a main scanning direction, said symbol being formed by said ink drops selectively successively or non-successively being deposited as said ink drops are deflected in said main scanning direction and means for controlling said voltage applied to said charging means for forming the printed symbols, wherein the improvement comprises means for controlling the time when said voltage is applied to said charging means in response to the successive or non-successive deposition of adjacent ink drops.

3,972,053

INK DROP PRINTER WITH TRANSFER MEMBERS

Stephen F. Skala, 3839 S. Wenonah, Berwyn, Ill. 60402

Continuation-in-part of Ser. No. 421,425, Dec. 3, 1973, abandoned. This application Aug. 20, 1975, Ser. No. 605,992

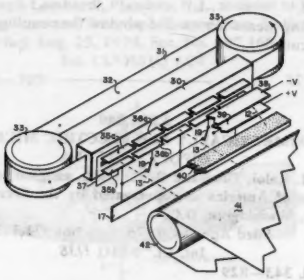
Int. Cl.² G01D *15/18, 9/00*

U.S. Cl. 346—75 **7 Claims**

1. A method of printing by selectively depositing liquid ink drops on a receiving surface in response to graphic information from a signal source, including the steps of

forming a plurality of equally spaced traversing ink drop trajectories,

projecting said ink drop trajectories toward a plurality of signal responsive selective structures having a linear array of signal members and transfer members, said transfer members switching between adjacent signal members, each member being separated from an adjacent member by a junction gap, and the spacing between the centers of similar members being equal to the spacing between said ink drop trajectories,



synchronizing switching of the transfer members with the position of the ink drop trajectories so that the signal members and the transfer members adjoining a junction gap are at the same selection intensity level when an ink drop trajectory is proximate to said junction gap, and

deflecting ink drops in said ink drop trajectories subject to said selection intensity levels so that ink drops selected for printing deposit on the receiving surface.

3,972,054

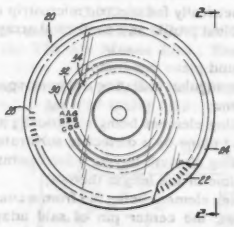
INDICIA DISC

Alfred H. Freericks, Hopatcong, N.J., assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed Feb. 19, 1974, Ser. No. 443,706

Int. Cl.² B41B *17/32*

U.S. Cl. 354—15 **2 Claims**



1. A disc assembly for use as a font storage medium in a phototypesetting apparatus, comprising:

1. a transparent disc having a continuous planar front face substantially impervious to air flow thereto, said disc having a concentric form about an axis of rotation;
2. a flexible sheet member bearing graphic subject matter mounted contiguous to said disc concentrically of the axis of rotation of said disc, and clamp means holding said flexible sheet in the central area thereof in a tightly clamped condition to the central area of said disc to couple the disc and the sheet as an assembly in a non-rotatable relative relationship;
3. drive mounting means for rotating said disc and sheet member assembly about the area of clamped contact, whereby a rotative speed resulting in centrifugal expul-

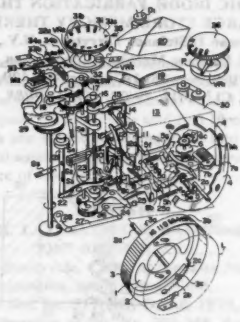
sion of atmosphere from the interface of the disc and sheet will hold the sheet fixed to the plane established by the disc solely by pressure differential resulting in atmospheric pressure clamping of the sheet to the disc.

3,972,055

MULTI-EXPOSURE CONTROL DEVICE FOR CAMERAS

Motonobu Matsuda, Izumi; Norio Beppu, Sennan, and Hiroshi Ueda, Nara, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed July 21, 1975, Ser. No. 597,433
Int. Cl.² G03B 7/08
U.S. Cl. 354—24 4 Claims



1. A multi-exposure control device for a camera, comprising:

an objective lens and a variable diaphragm;

means for automatically stopping-down said diaphragm from an open position prior to commencement of exposure in association with the release operation of the camera shutter mechanism;

diaphragm adjusting means for stopping said diaphragm;

means for selecting shutter speed providing a first mode for manual selection of shutter speed and a second mode for automatic shutter speed control;

means for generating an output signal corresponding to the shutter speed manually selected in said first mode;

means for producing an automatic exposure time control signal corresponding to the light passing through said objective lens and said diaphragm aperture;

a diaphragm control circuit for comparing said automatic exposure time control signal with said output signal and enabling said diaphragm adjusting means to stop the diaphragm when a predetermined relationship exists between said output signal and said automatic exposure time control signal;

means for stopping said diaphragm at a manually selected aperture;

means for terminating exposure;

an exposure time control circuit for controlling said means to terminate exposure in accordance with said automatic exposure time control signal;

a switching member movable between a first position for effecting manual exposure control based on manually selected shutter speed and diaphragm aperture and a second position for effecting automatic exposure control for automatically controlling said diaphragm aperture and shutter speed; and

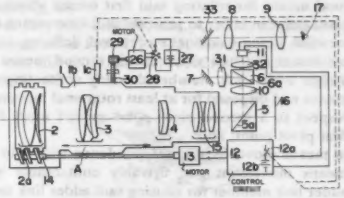
means for connecting said output signal to said exposure time control circuit and for disconnecting said automatic exposure time control signal to said exposure time control circuit with said switching member in said first position.

3,972,056

VARIFOCAL LENS ASSEMBLY

Kayoshi Tsujimoto, Osaka; Tohru Matsui; Haruo Abe, both of Sakai, and Mitsuaki Horimoto, Osaka, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 4, 1974, Ser. No. 529,596
Claims priority, application Japan, Dec. 14, 1973, 48-140508
Int. Cl.² G03B 7/08; G01J 1/20
U.S. Cl. 354—25 6 Claims



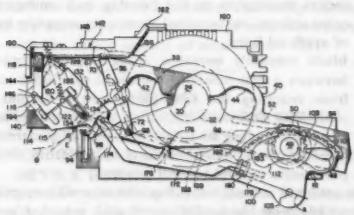
1. A varifocal lens assembly for use with a camera having a focal plane where an image of an object to be focused is projected, which comprises a lens barrel adapted to be coupled to said camera, an objective lens means supported within said lens barrel and including a plurality of lens groups other than a compensator lens group, a focal length varying means coupled to a first one of said lens groups for axially moving said first one of said lens groups along said lens barrel for varying the focal length of the varifocal lens assembly, adjusting means coupled to said varifocal lens assembly for adjusting the position of at least part of the varifocal lens assembly to adjust the position of the image plane formed by said varifocal lens assembly to compensate for the shift of the image plane resulting from the movement of said first lens group, means for detecting the position of the image plane where the object image is formed through said varifocal lens assembly and for subsequently generating an electric output signal in response to displacements between said image plane and the focal plane of the camera, and control means for operating said adjusting means in response to said electric output signal to bring said image plane into alignment with said focal plane.

3,972,057

EXPOSURE CONTROL SYSTEM WITH FOLLOW FOCUS CAPABILITY

George D. Whiteside, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 3, 1975, Ser. No. 554,926
Int. Cl.² G03B 7/16
U.S. Cl. 354—27 33 Claims



1. An exposure control mechanism for photographic apparatus of the type having a housing and an optical objective mounted on the housing comprising:

focusing means moveable to adjust the optical objective along an optical path;

exposure means having at least one element movable along a locus of travel and defining a range of apertures over the optical path in correspondence with said element movement;

first means disposed for rotation about a first pivot point in spaced relation with respect to said exposure element locus of travel for arresting movement of said exposure element along said locus of travel to define a select maximum aperture value out of said range of apertures on the optical path, said first means also including an interceptor edge;

second means for rotating said first means about said first pivot point in order to position said interceptor edge at a location along said locus of travel defining said select maximum aperture wherein said second means includes a rigid adder link member drivably contacting said first means and disposed for at least rotational movement with respect to a second pivot point spaced apart from said first pivot point; and

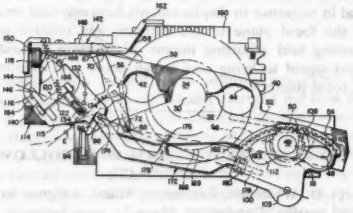
cam means movable in correspondence with said focusing means movement and drivably contactable with said adder link member for causing said adder link member to rotate said first means about said first pivot point in order to locate said interceptor edge at a select position establishing said select maximum aperture in correspondence with the distance at which the photographic scene is focused from the optical objective.

3,972,058

FOLLOW FOCUS INTERCEPT ACTUATING SYSTEM FOR PHOTOGRAPHIC APPARATUS

Bruce K. Johnson, Andover, and George D. Whiteside, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 3, 1975, Ser. No. 554,925
Int. Cl.² G03B 7/00
U.S. Cl. 354—149 **27 Claims**



1. Apparatus for a camera including a housing and an objective lens mounted on said housing and defining a film plane, said apparatus comprising:

a socket mountable on the housing and configured to receive at least one terminal element connecting to a source of artificial light;

a blade assembly movable along a predetermined path between a first position wherein it precludes scene light from reaching the film plane and a second position wherein it defines a maximum size aperture, said blade assembly serving to define a range of progressively increasing sized apertures as it moves from its said first position to its said second position;

an actuator mounted for displacement with respect to said socket wherein a portion of said actuator is normally disposed adjacent said socket to automatically be engaged and displaced by the terminal element of the artificial light source as it is inserted into said socket;

an interceptor; and

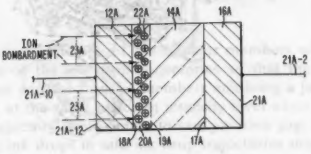
means for connecting said interceptor to said actuator, said connecting means being configured and arranged to position said interceptor in spaced apart relation relative to the plane of said predetermined path so as not to interfere with the movement of said blade between its said first and second positions prior to the insertion of the terminal element of the source of artificial light into said socket and to cause said interceptor to be displaced transversely, responsive to said actuator being displaced when the terminal element of the source of artificial light is inserted into said socket, into said predetermined path so that it will be operative to restrain the movement of said blade assembly as said blade assembly moves from its said first position towards its said second position, said interceptor thus serving to establish the largest aperture to be defined by said blade assembly at such times.

3,972,059

DIELECTRIC DIODE, FABRICATION THEREOF, AND CHARGE STORE MEMORY THEREWITH

Thomas Herman DiStefano, Tarrytown, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 28, 1973, Ser. No. 429,460
Int. Cl.² H01L 49/02, 29/12, 29/88, 29/34
U.S. Cl. 357—6 **6 Claims**



1. A multilayer diode operable with relatively low reverse bias leakage current and with relatively large forward bias Fowler-Nordheim tunneling current comprising:

a conductive anode electrode;

a first insulator layer adjacent to said anode electrode comprised of an insulator selected from the group of insulators consisting of SiO_2 and Al_2O_3, said insulator layer and said anode electrode having a relatively high contact energy barrier therebetween;

a second insulator layer adjacent to said first insulator layer comprised of an oxide of a metal selected from the group consisting of Nb, Ta, V, W, Hf, and Mn, said second insulator layer including a given concentration of substantially immobile excess positive ions and having thickness less than approximately 100 A; and

a metallic cathode electrode comprised of a metal selected from the group of metals consisting of Nb, Ta, Al, V, W, Hf and Mn adjacent to said second insulator layer, said cathode electrode said second insulator layer having a relatively low energy contact barrier therebetween due to said positive ions.

3,972,060

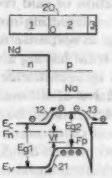
SEMICONDUCTOR COLD ELECTRON EMISSION DEVICE

Katsuo Hara; Minoru Hagino, and Tokuzo Sukegawa, all of Hamamatsu, Japan, assignors to Hamamatsu Terebi Kabushiki Kaisha, Hamamatsu, Japan

Filed Mar. 18, 1974, Ser. No. 451,754
Claims priority, application Japan, June 28, 1973, 48-72293
Int. Cl.² H01L 29/161, 27/14, 29/20
U.S. Cl. 357—30 **2 Claims**

1. A cold emission semiconductor device comprising a first layer of GaAlP, and of several hundred Angstroms in thickness and of n-type conductivity; a second layer of GaAlP of p-type conductivity and of a thickness less than the diffusion length of electrons and whose effective forbidden band gap is smaller than that of said first layer, said first and said second

layers being intimately in contact with each other through epitaxial growth and with substantial lattice match to form a heterojunction, said second layer having a surface opposite said heterojunction with zero or negative electron affinity for emission of electrons, a first electrode connectable to said first layer, and a second electrode connectable to said second layer



with the distance between said second electrode and said heterojunction being more than the diffusion length of electrons, and means for applying a potential to said electrodes to bias said heterojunction and cause said first layer to generate electrons which are subsequently injected into said second layer and without substantially any recombination and emitted from said surface of said second layer.

3,972,061

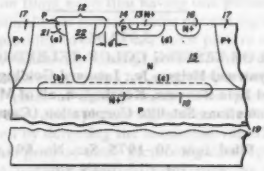
MONOLITHIC LATERAL S.C.R. HAVING REDUCED "ON" RESISTANCE

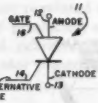
Carl T. Nelson, Sunnyvale, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 511,289, Oct. 2, 1974, abandoned, which is a continuation of Ser. No. 385,348, Aug. 3, 1973, abandoned. This application Aug. 6, 1975, Ser. No. 602,378

Int. Cl.² H01L *29/74*

U.S. Cl. 357—38 **11 Claims**





1. In a monolithic lateral silicon controlled rectifier of the type having PNP and NPN transistor portions:

a silicon semiconductive body having laterally spaced first P, first N, second P, and second N type conductivity regions to define a lateral silicon controlled rectifier semiconductive structure, said first and second P and said second N type regions being embedded in said first N type region; and further said second N type region being embedded in said second P type region

said semiconductive member having an N+ type conductivity subcollector layer underlying said P, N, P and N regions in contiguous relation with said first N type region; and

said first P type conductivity region including a portion extending below the depth of said second P type region toward said underlying N+ subcollector layer for defining with said N+ subcollector and said second P type region a vertical PNP transistor portion of the silicon controlled rectifier, such vertical PNP transistor portion having a current gain which is relatively small compared to the current gain of the NPN transistor portion and for reducing the anode-to-cathode on resistance of the silicon controlled rectifier structure and the product of the current gains of the PNP and NPN transistor portions of said silicon controlled rectifier being greater than one.

3,972,062

MOUNTING ASSEMBLIES FOR A PLURALITY OF TRANSISTOR INTEGRATED CIRCUIT CHIPS

Gene P. Hopp, Wheeling, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 403,370, Oct. 4, 1973, abandoned. This application Feb. 21, 1975, Ser. No. 551,941

Int. Cl.² H01L *23/48, 23/02, 25/04, 29/44*

U.S. Cl. 357—68 **8 Claims**

1. A mounting assembly for a transistor chip including a body portion having a first surface and an opposite surface, base and emitter electrodes extending predeterminedly from said first surface and a collector electrode formed along said opposite surface, said mounting assembly including in combination; said transistor chip and a support member of conductive material, the support member having a central cavity therein having a floor and portions adjacent said cavity comprising support feet extending laterally outwardly from said cavity on opposite sides thereof and having an upper surface, a tinned coating adhered to the support member including the cavity and the upper surface of the support feet, said cavity measured from said floor to the upper surface of said laterally extending portions being of a depth equal to the height of said transistor chip as measured from the free ends of said base and emitter electrodes to said collector electrode, said transistor chip being received in said cavity with said collector electrode being joined mechanically and electrically to the floor of the cavity, said base and emitter electrodes extending outwardly of said cavity such that the free ends of said electrodes are coplanar with the upper surface of said support feet.

3,972,063

VAPOR COOLED SEMICONDUCTOR DEVICE ENCLOSED IN AN ENVELOPE HAVING A COMPRESSION MECHANISM FOR HOLDING SAID DEVICE WITHIN SAID ENVELOPE

Yoshio Kimura; Hiroshi Mitsuoka, and Isamu Hosono, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 10, 1974, Ser. No. 513,924

Claims priority, application Japan, Oct. 19, 1973, 48-117620; Nov. 10, 1973, 48-126989

Int. Cl.² H01L *25/04, 23/42, 23/44, 23/46*

U.S. Cl. 357—82 **18 Claims**

1. A vapor-cooled semiconductor device, said device comprising:

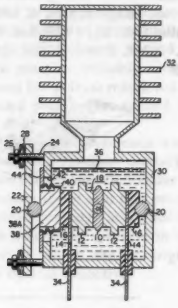
an envelope having at least one side wall with an opening therethrough;

a semiconductor stack fitted within said envelope with one end directed toward said opening, said stack comprising:

a pair of heat-dissipation blocks,

at least one semiconductor element sandwiched between said dissipation blocks,

at least two electrodes, one on each side of said dissipation blocks opposite the side contacting said semiconductor element, said electrodes extending through said envelope wall, and



electrical insulation against the sides of said electrodes opposite the sides thereof contacting said heat dissipation blocks;

sealing and pressurizing means fitted through said opening in said envelope and adjacent said semiconductor stack for hermetically closing said opening, pressurizing said envelope and holding said semiconductor stack within said envelope; and

cooling fluid partially filling said sealed envelope surrounding said stack, whereby said semiconductor element is cooled by the latent heat of vaporization of said cooling fluid.

3,972,064

APPARATUS AND METHODS FOR PLAYBACK OF COLOR PICTURE/SOUND RECORDS

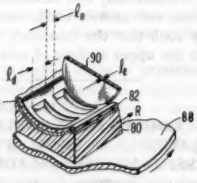
Eugene Orville Keizer, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 441,069, Feb. 11, 1974. This application Dec. 9, 1974, Ser. No. 531,138

Claims priority, application United Kingdom, Mar. 20, 1973, 13234/73

Int. Cl.² H04N 5/76

U.S. Cl. 358—4 **2 Claims**



1. Playback apparatus, for use with a disc record having a spiral groove containing an information track in the form of a succession of groove bottom geometry variations representative of associated color picture and sound information components, said playback apparatus comprising the combination of:

means including a record supporting turntable for rotating said disc record;

means, comprising a stylus having a groove-entering tip including a conductive electrode, for developing capacitance variations representative of the successive groove bottom geometry variations in the information track of said record under conditions of groove reception of said stylus tip and rotation of said record;

capacitance variation detecting means coupled to said stylus for developing, in response to said capacitance variations, an impulse train having a relatively high repetition rate which varies in accordance with a composite color video signal inclusive of a luminance signal component occupying a predetermined band of frequencies and a chrominance signal component sharing a midband portion of said predetermined band, and having a duty cycle which varies in cyclical fashion at a relatively low frequency which varies in accordance with said sound information components;

first band pass filter means responsive to the output of said detecting means and having a passband encompassing the variation range for said relatively low frequency and sideband regions adjacent thereto to the exclusion of the variation range for said relatively high repetition rate and to the exclusion of said midband portion of said predetermined band;

first FM demodulator means responsive to the output of said first bandpass filter means, for recovering said sound information components;

second band pass filter means responsive to the output of said detecting means and having a pass band encompassing the variation range for said relatively high repetition rate and sideband regions adjacent thereto to the exclusion of the variation range for said relatively low frequency; and

second FM demodulator means, responsive to the output of said second bandpass filter means, for recovering said composite color video signal.

3,972,065

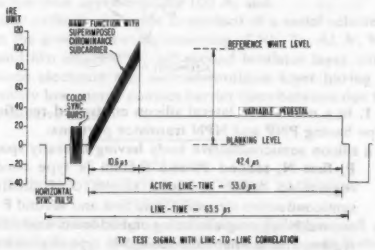
METHOD OF TESTING COLOR TELEVISION SYSTEMS

Melville Lynwood Heiges, Jr.; Leonard Golding, both of Rockville, and Bela Banyasz, Kensington, all of Md., assignors to Communications Satellite Corporation (Comsat), Washington, D.C.

Filed June 30, 1975, Ser. No. 591,673

Int. Cl.² H04N 9/62

U.S. Cl. 358—10 **4 Claims**



TV TEST SIGNAL WITH LINE-TO-LINE CORRELATION

1. A method of testing both analog and digital color television systems comprising:

generating a single test signal having a duration equal to the active line-time of one full line-time duration defined as the time between the leading edges of two consecutive horizontal synchronizing pulses, said test signal being composed of a linear ramp function having superimposed thereon a chrominance subcarrier for twenty percent of the duration of the active line-time and a variable ampli-

tude pedestal for eighty percent at the duration of the active line-time,

applying said test signal to television equipment under test, and

measuring both the differential-phase and differential-gain of the television equipment under test.

3,972,066

METHOD FOR IMAGE REGULATION OF COLOR MONITORS IN PROOF-VIEWING AND AN APPARATUS THEREFOR

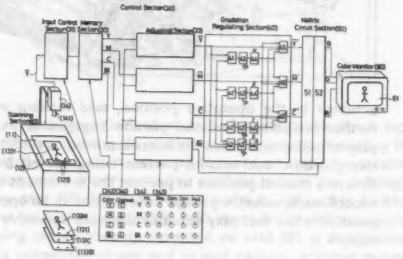
Ikuo Seki, Tokyo, and Masahiko Kato, Kodaira, both of Japan, assignors to Toppan Printing Co., Ltd. and Hitachi Electronics Ltd., both of Tokyo, Japan

Filed Dec. 19, 1974, Ser. No. 534,367

Claims priority, application Japan, May 31, 1974, 49-61504

Int. Cl.² H04N *9/02*

U.S. Cl. 358—76 **6 Claims**



1. A method for image regulation of a color monitor in proof-viewing which comprises the steps of: scanning a plurality of separation films, each film having one primary color, to obtain a like plurality of primary color picture signals; obtaining each of a plurality of secondary color picture signals from an NAM (Non-Additively Mixing) portion which is derived by detecting the maximum value of each respective one of all combinational pairs of said primary color picture signals; obtaining a tertiary color picture signal from the NAM portion which is derived by detecting the maximum value of a combination of all said primary color picture signals; regulating said secondary and tertiary color picture signals by multiplying regulation factors; correcting the gradations of said primary color picture signals by said regulated secondary and tertiary color picture signals; and producing an image on the color monitor screen wtih said corrected primary color picture signals and said tertiary color picture signal.

3,972,067

COLOR VIDEO SYNTHESIZER WITH MONOCHROME INPUT

David L. Peters, Whitney Point, N.Y., assignor to The Singer Company, New York, N.Y.

Filed Jan. 17, 1975, Ser. No. 541,844

Int. Cl.² H04N *9/02*; G05F *3/02*; G09B *9/08*

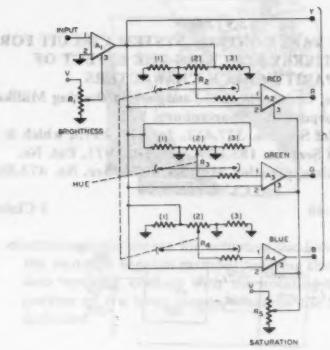
U.S. Cl. 358—81 **10 Claims**

2. Apparatus for presenting full color video signals to a color display system wherein the input signal to said apparatus is a video signal which may have no color content of its own, said apparatus comprising:

means to divide said input signal into at least three pair of signal paths;

means to simultaneously variably apportion among first ones of each pair of signal paths the level of said divided input signal appearing there;

means to add the signals on the first and second ones of each pair of signal paths in a simultaneously controlled manner such that the contribution to the sum signal from one signal path of said pairs will be descreased while the contribution from the other signal path of said pair will be increased; and



means to present each of said summed signal pairs to a color display system as color information signals; and

means to present a portion of said input signal to said color display system as a luminance signal.

3,972,068

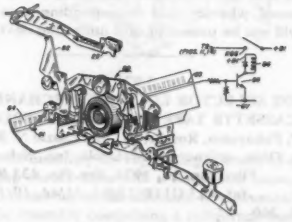
SYSTEM FOR TRANSLATING MAGNETICALLY ENCODED DATA TO VISUALLY READABLE CHARACTERS CORRESPONDING THERETO

Joseph R. Andreaggi, Short Hills; Robert J. Graf, Newark, and Matthew J. Relis, Teaneck, all of N.J., assignors to Joseph R. Andreaggi, Short Hills, N.J.

Division of Ser. No. 250,872, May 8, 1972, Pat. No. 3,823,405. This application Dec. 28, 1973, Ser. No. 429,680

Int. Cl.² G11B *5/00*, *5/55*

U.S. Cl. 360—4 **2 Claims**



1. A system for translating a plurality of magnetically encoded tracks of data on one side of a flexible medium into corresponding visually readable characters comprising:

a drum of substantially cylindrical shape mounted for rotation about an axis thereof;

means mounting the medium on the exterior surface of said drum with the one side facing outwardly thereof and oriented such that at least certain ones of the data tracks are aligned substantially perpendicularly with said axis;

a magnetic read head mounted to contact the medium;

means for stepping said head in directions substantially parallel to said axis across a portion of the medium;

a portion of said drum extending substantially parallel to said axis providing an axially extending zone wherein the drum surface is devoid of magnetized data;

means responsive to the rotation of said drum coupled to the stepping means for synchronizing the stepping means to advance said head from one data track to another when the drum portion is opposite said head; and

means responsive to the electrical output of said head from printing visually readable characters representing the magnetic data on the medium.

3,972,069

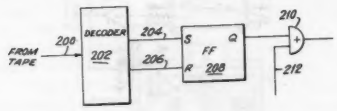
MAGNETIC TAPE CONTROL SYSTEM CIRCUIT FOR SELECTIVELY BLOCKING THE EFFECT OF PARITY-CHECK CHARACTERS

Zane Frentress, Greenville, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Continuation of Ser. No. 327,411, Jan. 29, 1973, which is a division of Ser. No. 185,689, Oct. 10, 1971, Pat. No. 3,741,139. This application May 28, 1974, Ser. No. 473,882

Int. Cl.[2] G11B *5/09*

U.S. Cl. 360—48 **3 Claims**



1. A circuit for use with a data store, a data reader, and a utilization device for said data, said data store having a plurality of pairs of records interleaved with each other and a parity character unequally spaced between successive pairs of said records so as to be closer to the pair of records on one side than to the pair or records on the other side, each of said pairs of records having at one of its ends a stop-command-forward character and at the other of its ends a stop-command-reverse character, said circuit comprising: gate means for passing read data, including data embodied in said parity character, from the data reader to the utilization device; means for identifying said stop-command-reverse character and said stop-command-forward character; and means for disabling said gate means in response to identification of one of said stop-command characters at the end of a record farther from the parity character between that record and the next record and for enabling said gate means in response to identification of the other of said stop-command character; at the beginning of a next record, whereby data corresponding to said parity character will not be passed to said utilization device.

3,972,070

MODE SELECTOR LOCKOUT MECHANISM FOR A CASSETTE TAPE RECORDER/REPRODUCER

Gary P. Fukayama, Roselle, Ill., and Laszlo N. Repay, Chagrin Falls, Ohio, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 16, 1974, Ser. No. 433,961

Int. Cl.[2] G11B *23/04, 15/44, 19/16*

U.S. Cl. 360—77 **10 Claims**

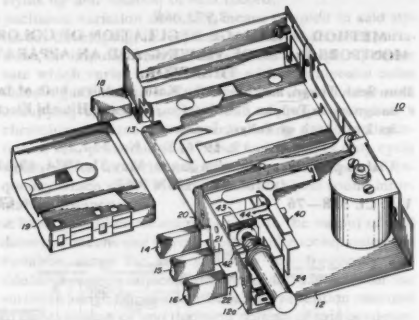
1. A mode selector mechanism for use in a magnetic tape recorder/reproducer device adapted for receipt of a tape cassette, and having a housing, a cassette receiving opening and a tape drive mechanism, the combination including:

a plurality of actuators mounted in said housing and including at least a play and a record actuator, each having a plunger arm portion extending outwardly therefrom and each being slideably movable between an at rest position and an operative position,

connector means coupled to said tape drive mechanism and engageable with at least one of said actuator plunger arm portions for actuating the tape drive mechanism to an operative condition with respect to said tape cassette,

means mounted in the housing having an arm movable between an unoperated and operated position in accordance with the insertion of a cassette into the receiving opening for activating the mode selector mechanism, and,

actuator locking means positioned in the housing and having a first portion engaged by said arm, said first portion of said locking means being movable from a first position to a second position when said arm is in said operated position, said portion, when in said second position, being selectively engageable with at least one of said actuator plunger arms with the same being moved to the operative position to hold the said plunger arm in said last-mentioned position, said first portion being moved from the second to the first position to prevent movement of said



actuator to the operative position, said locking means further including a second portion engageable by said play actuator arm when the latter is moved to said operative position, said second portion being moved from a first to a second position to prevent the movement of the record mode selector plunger arm portion to an operated position while said play actuator is in said operative position.

3,972,071

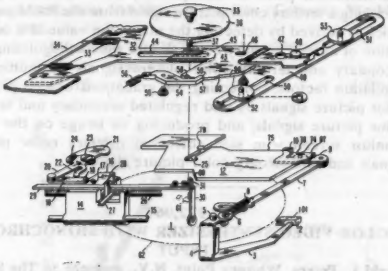
PORTABLE RECORDER CONTROL APPARATUS

William Marshall Arrington, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 27, 1975, Ser. No. 590,763

Int. Cl.[2] G11B *15/10, 15/24, 19/02, 19/18*

U.S. Cl. 360—86 **10 Claims**



1. A portable recorder control apparatus for both facilitating the performance of multiple dictation functions and performing record media handling operations through manipulation of a single button, said apparatus comprising:

a. first means operable by said button for causing a recorder to be conditioned for performing said dictation functions upon positioning said button in dictation function locations along a function and operation path;

b. means for causing a record medium to be unloaded from said recorder;

c. means for causing a transducer to be repositioned during unloading of said record medium; and

d. second means operable by said button and including 1) means for causing said record medium to be unloaded by

said unloading means, and 2) means for causing said transducer to be repositioned by said repositioning means, as said button is moved along said path to an operation location.

3,972,072
DEVICE FOR INTRODUCING AND EJECTING A MAGNETIC TAPE CASSETTE FOR A MAGNETIC TAPE RECORDER

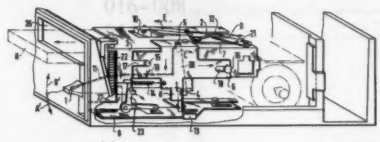
Oskar Hubert Richt, Socking, Germany, assignor to Uher Werke Munchen, Munich, Germany

Filed May 8, 1974, Ser. No. 468,082

Claims priority, application Germany, May 8, 1973, 2323171

Int. Cl.² G11B *23/06, 15/24*

U.S. Cl. 360—93 **9 Claims**



1. A cassette introduction and ejection device for a tape recorder comprising, in combination, a cassette mounting lift arranged for pivotal movement between an upper inoperative position and a lower operative position, means for yieldingly urging said lift into said upper position, releasable locking means for locking said lift in said operative position, cassette gripping means slidably mounted on said lift, a dead center spring connected at one end to said cassette gripping means, linkage means operatively connected between said lift and the other end of said dead center spring, an operating element pivotally mounted on said lift in operative association with said linkage means, stop means on said lift, means for yieldingly urging said linkage means into a first position against said stop means to position said operating element in an intermediate position and to condition said dead center spring for movement of said gripping means in one direction to carry an inserted cassette into a fully inserted position in said lift, said operating element being pivotally movable downwardly from said intermediate position to move said lift into said lower operative position and to permit locking engagement between said locking means and said lift, said operating element being pivotally movable upwardly from said intermediate position to release said lift locking means for movement of said lift into said upper inoperative position by said urging means and to move said linkage means into a second position to condition said dead center spring for movement of said cassette gripping means in the opposite direction to reject said inserted cassette from said lift.

3,972,073
AUTOMATIC TAPE CARTRIDGE EJECTION MECHANISM FOR MULTITRACK CARTRIDGE PLAYERS

Edwin Stanley Bara, Chicago, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 23, 1974, Ser. No. 535,773

Int. Cl.² G11B *25/04, 15/10, 15/29*

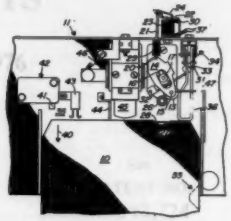
U.S. Cl. 360—93 **9 Claims**

1. In a magnetic tape recorder/reproducer mechanism for utilizing a multitrack tape cartridge, a device for ejecting the cartridge, the device comprising:

a capstan;

lever means for ejecting the cartridge;

friction means for transferring actuating force from the capstan to the lever means, and including a movable support member, a linking means for activating the support member, a friction roller rotatably mounted on the support member, the roller deriving power for ejection from the capstan; and



electromagnetic means for actuating the linking means and the movable support member to bring the friction roller into wedging contact with the rotating capstan and a portion of the lever means, whereby the lever means is activated.

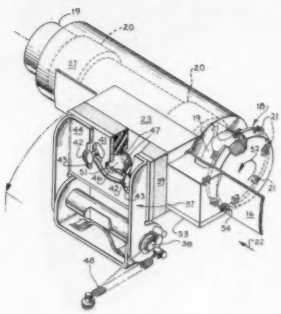
3,972,074
TAPE GUIDE ASSEMBLY FOR ROTATING HEAD

Charles A. Vogel, San Jose, Calif., assignor to American Videonetics Corporation, Sunnyvale, Calif.

Filed Feb. 10, 1975, Ser. No. 548,236

Int. Cl.² G11B *15/60*

U.S. Cl. 360—130 **4 Claims**



1. A tape guide assembly for registering one side of a longitudinally moving record tape with a transducer moving in a plane disposed crosswise to the direction of movement of the tape, said guide assembly comprising a cylindrical barrel disposed alongside the path of said tape with the tape moving lengthwise of and in spaced relation to said barrel, said transducer rotating coaxially of said barrel in a transverse plane at a predetermined radius therein, a female guide including an elongate body portion having a relieved side portion confronting said barrel with the tape moving lengthwise between and in spaced relation to said relieved side portion and said, a pair of cylindrically shaped registration lands carried by said body portion and flanking said transverse plane, said registration lands engaging and registering the other side of said tape, the radius of said lands being sufficiently less than said predetermined radius to cause said transducer to uniformly engage and transduce a path crosswise of said tape, a plurality of pairs of surface portions carried by said body portion, each of the last named surface portions lying in an imaginary cylinder having a radius corresponding to the radius of said lands and taken about a center common to said lands and said surface portions, said surface portions of each pair engaging said barrel adjacent opposite edges of the tape, one said pair being displaced axially along said barrel from another said pair.

DESIGN PATENTS

GRANTED JULY 27, 1976

ERRATA

For CLASS	See PATENT NO.
025-089	240,724
025-075	240,725
023-058	240,727
016-008	240,766
016-026	240,765

240,670
WET SUIT
Eric Gewirz, 7110 Crail Drive
Bethesda, Md. 20034
Filed Oct. 11, 1974, Ser. No. 514,075
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—29

240,671
BASEBALL GLOVE
James Robert McTear, 32 Squadron Line,
Simsbury, Conn. 06070
Filed Apr. 2, 1975, Ser. No. 564,502
Term of patent 14 years
Int. Cl. D2—*06*
U.S. Cl. D2—361

240,672
BASEBALL GLOVE
James Robert McTear, 32 Squadron Line,
Simsbury, Conn. 06070
Filed Apr. 2, 1975, Ser. No. 564,519
Term of patent 14 years
Int. Cl. D2—*06*
U.S. Cl. D2—361

240,673
BASEBALL GLOVE
James Robert McTear, 32 Squadron Line,
Simsbury, Conn. 06070
Filed Apr. 2, 1975, Ser. No. 564,520
Term of patent 14 years
Int. Cl. D2—*06*
U.S. Cl. D2—361

240,674
BASEBALL GLOVE
James Robert McTear, 32 Squadron Line,
Simsbury, Conn. 06070
Filed Apr. 2, 1975, Ser. No. 564,566
Term of patent 14 years
Int. Cl. D2—*06*
U.S. Cl. D2—361

240,675
BASEBALL GLOVE
James Robert McTear, 32 Squadron Line,
Simsbury, Conn. 06070
Filed Apr. 2, 1975, Ser. No. 564,567
Term of patent 14 years
Int. Cl. D2—*06*
U.S. Cl. D2—361

240,676
BASEBALL GLOVE
James Robert McTear, 32 Squadron Line, Simsbury, Conn. 06070
Filed Apr. 2, 1975, Ser. No. 564,568
Term of patent 14 years
Int. Cl. D2—*06*
U.S. Cl. D2—361

240,677
TOOTHBRUSH
Dallas Glenn Thompson, 250–A W. Vista Way, Vista, Calif. 92083
Filed Apr. 24, 1975, Ser. No. 571,409
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—25

240,678
HANDLE FOR PAINT ROLLERS AND BRUSHES
Else Herig, Rechtenstein, Germany, assignor to H. L. Sterkel AG, Comet-Pinselfabrik
Filed Oct. 21, 1974, Ser. No. 516,680
Claims priority, application Germany May 18, 1974
Term of patent 7 years
Int. Cl. D4—*04;* D8—*05*
U.S. Cl. D4—38

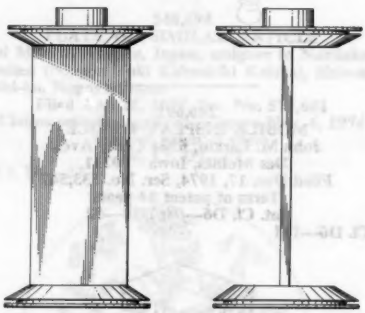
240,679
CHAIR
Charles Bernard, Montreuil-sous-Bois, France, assignor to Airborne S.A.
Filed Mar. 20, 1972, Ser. No. 236,566
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31

240,680
SEAT OR SIMILAR ARTICLE
Stanley P. Nash, Rte. 1, Riverhill Drive, Johnson Creek, Wis. 53038
Filed Aug. 30, 1973, Ser. No. 392,854
Term of patent 3½ years
Int. Cl. D6—*01*
U.S. Cl. D6—62

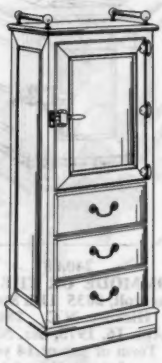
240,681
SUPPORT FOR RAZORS OR THE LIKE
Vincent J. Granatelli, Santa Monica, Calif, assignor to Paxton Products, Inc., Santa Monica, Calif.
Filed July 25, 1975, Ser. No. 599,069
Term of patent 14 years
Int. Cl. D6—*04;* D8—*02;* D23—*02*
U.S. Cl. D6—88

240,682
CONTAINER FOR TOILET TISSUE ROLLS AND TOILET BOWL BRUSHES AND THE LIKE
Gwendolyn Robles, 917 Sheridan Ave., Bronx, N.Y. 10451
Filed Mar. 25, 1975, Ser. No. 561,781
Term of patent 14 years
Int. Cl. D6—*04;* D23—*02*
U.S. Cl. D6—97

240,683
COMBINED AIR CIRCULATOR AND ROOM DIVIDER
Don A. Taylor, 216 Mills St., Wadsworth, Ohio 44281
Filed Dec. 30, 1974, Ser. No. 537,790
Term of patent 14 years
Int. Cl. D6—*06;* D23—*04*
U.S. Cl. D6—139

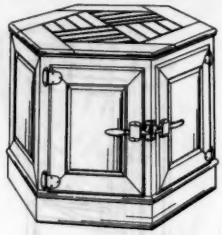


240,684
VERTICAL BAR OR THE LIKE
David P. Zagaroli, 2035 11th Street Court NW., Hickory, N.C. 28601
Filed Apr. 16, 1975, Ser. No. 568,509
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—144

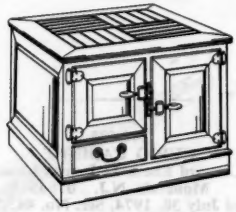


240,685
CURIO CABINET
Leonard Eisen, 14 Lomas Lane, Montvale, N.J. 07645
Filed July 30, 1974, Ser. No. 493,156
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—148

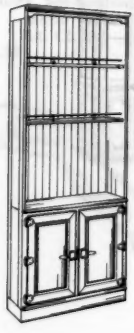
240,686
HEXAGONAL COMMODE OR THE LIKE
David P. Zagaroli, 2035 11th Street Court NW., Hickory, N.C. 28601
Filed Apr. 16, 1975, Ser. No. 568,508
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—149



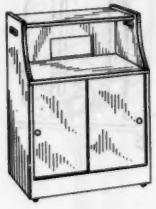
240,687
COMMODE OR THE LIKE
David P. Zagaroli, 2035 11th Street Court NW., Hickory, N.C. 28601
Filed Apr. 16, 1975, Ser. No. 568,507
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—158



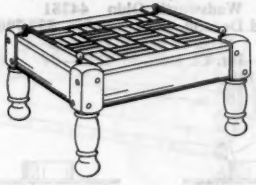
240,688
BOOKCASE OR THE LIKE
David P. Zagaroli, 2035 11th Street Court NW., Hickory, N.C. 28601
Filed Apr. 16, 1975, Ser. No. 568,511
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—168



240,689
CABINET FOR VIDEO EQUIPMENT OR THE LIKE
Richard J. Warneke, 915 W. Miner St., Arlington Heights, Ill. 60005
Filed July 29, 1974, Ser. No. 492,461
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—174

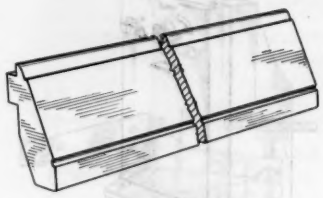


240,690
COCKTAIL TABLE OR THE LIKE
David P. Zagaroli, 2035 11th Street Court NW., Hickory, N.C. 28601
Filed Apr. 16, 1975, Ser. No. 568,510
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177

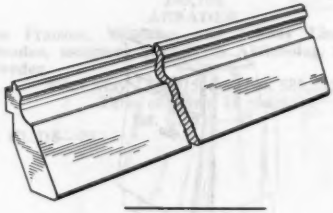


240,691
MOBILE DISPLAY DEVICE
John M. Larkin, 6304 Colby Ave., Des Moines, Iowa 50311
Filed Dec. 17, 1974, Ser. No. 533,547
Term of patent 14 years
Int. Cl. D6—*04*; D20—*02*
U.S. Cl. D6—181

240,692
PICTURE FRAME MOULDING
Johannes Vihma, Toronto, Ontario, Canada, assignor to Artistic Woodwork Co., Ltd., Downsview, Ontario, Canada
Filed May 16 1975, Ser. No. 578,326
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—246



240,693
PICTURE FRAME MOULDING
Johannes Vihma, Toronto, Ontario, Canada, assignor to Artistic Woodwork Co., Ltd., Downsview, Ontario, Canada
Filed May 16, 1975, Ser. No. 578,327
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—246



240,694
PLATE OR SIMILAR ARTICLE
Seiichi Makita, Nagoya, Japan, assignor to Noritake Co., Limited (Nippon Toki Kabushiki Kaisha), Shin-machi, Nishi-ku, Nagoya, Japan
Filed Apr. 25, 1975, Ser. No. 571,661
Claims priority, application Japan Nov. 6, 1974
Term of patent 7 years
Int. Cl. D7—*01*
U.S. Cl. D7—23

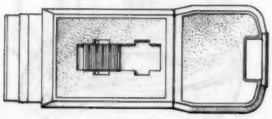
240,695
PLATE OR SIMILAR ARTICLE
Seiichi Makita, Nagoya, Japan, assignor to Noritake Co., Limited (Nippon Toki Kabushiki Kaisha), Shin-machi, Nishi-ku, Nagoya, Japan
Filed Apr. 25, 1975, Ser. No. 571,662
Claims priority, application Japan Nov. 6, 1974
Term of patent 7 years
Int. Cl. D7—*01*
U.S. Cl. D7—23

240,696
MIXER BOWL SPLASH GUARD
Sarah Tretter, 45 Southport St., Toronto, Ontario, Canada
Filed Dec. 10, 1974, Ser. No. 531,259
Claims priority, application Canada June 17, 1974
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—131

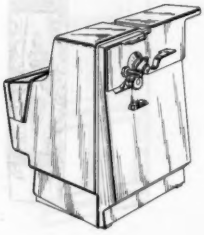
240,697
SPOON OR SIMILAR ARTICLE
Colin B. Richmond II, Oneida, N.Y., assignor to Oneida, Ltd., Oneida, N.Y.
Filed Mar. 11, 1974, Ser. No. 449,746
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—151

240,698
SHAMPOO TANK FOR A FLOOR CLEANING MACHINE OR THE LIKE
Charles V. Durkee, Indianapolis, Ind., assignor to Earl Grissmer Company, Inc., Indianapolis, Ind.
Filed Apr. 10, 1974, Ser. No. 459,596
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—170

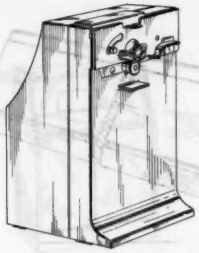
240,699
RAZOR BLADE SCRAPER
Ronald L. Gerson, Newton, and Lawrence A. Caprio, Whitman, Mass., assignors to Louis M. Gerson Co., Inc., Middleboro, Mass.
Filed Dec. 19, 1974, Ser. No. 534,451
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—181



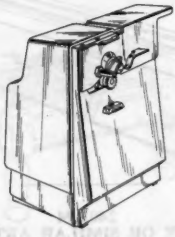
240,700
COMBINED ELECTRIC CAN OPENER AND CUTLERY GRINDER
Robert J. Scott, Blue Springs, and Bill G. Mead, Raytown, Mo., assignors to Rival Manufacturing Company, Kansas City, Mo.
Filed Mar. 20, 1975, Ser. No. 560,298
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D8—35



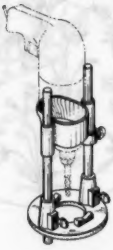
240,701
ELECTRIC CAN OPENER
Downer P. Dykes, Lawrence, Kans., assignor to Rival Manufacturing Company, Kansas City, Mo.
Filed Oct. 31, 1974, Ser. No. 519,576
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D8—36



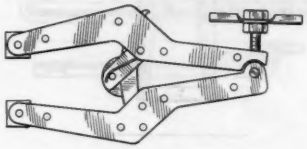
240,702
ELECTRIC CAN OPENER
Robert J. Scott, Blue Springs, and Bill G. Mead, Raytown, Mo., assignors to Rival Manufacturing Company, Kansas City, Mo.
Filed Mar. 20, 1975, Ser. No. 560,253
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D8—36



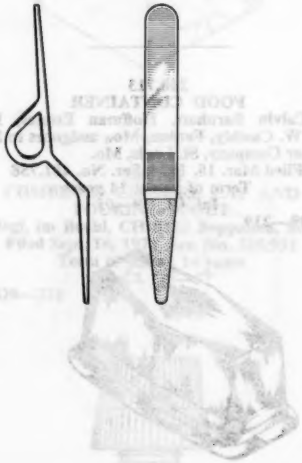
240,703
DRILL HOLDER
William D. Russell, San Diego, Calif., assignor to Portalign Tool Company, San Diego, Calif.
Filed Feb. 7, 1975, Ser. No. 548,154
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—71



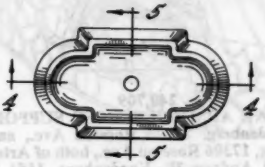
240,704
CLAMP
Harold M. Busse, 3563 Jerry St., White Bear Lake, Minn. 55110
Filed May 1, 1975, Ser. No. 573,726
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—72



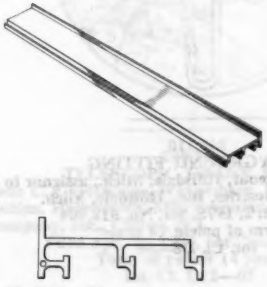
240,705
ABRADER
Hans Franzen, Vendelso, and Johnny Lind, Alvsjo, Sweden, assignors to Sandvik Aktiebolag, Sandviken, Sweden
Filed May 23, 1975, Ser. No. 580,225
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—90



240,706
ESCUTCHEON
James M. Palm, Jr., Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.
Filed May 13, 1974, Ser. No. 469,396
Term of patent 14 years
Int. Cl. D8—*06, 09*
U.S. Cl. D8—179



240,707
DRAPERY ROD
Robert S. Rudinski, 515 East St., Elkhart, Ind. 46614
Filed Aug. 29, 1975, Ser. No. 608,846
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D8—208



240,708
CONCRETE REINFORCING ACCESSORY
Robert J. Ilukowicz, Coram, N.Y., assignor to Preco Industries, Ltd., Plainview, N.Y.
Filed May 29, 1975, Ser. No. 581,864
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—228

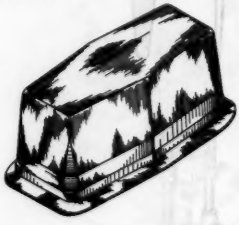
240,709
RADIAL ARM MILK HOSE SUPPORT
Ben W. Vandenberg, 17226 Roseton Ave., and August Vandenberg, 17306 Roseton Ave., both of Artesia, Calif. 90701, and Andrew W. Vandenberg, 1551 Ryon St., Bellflower, Calif. 90706
Filed Nov. 21, 1974, Ser. No. 525,878
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—233

240,710
PLAYGROUND FITTING
Dwight C. Shaneour, Hillsdale, Mich., assignor to Quality Industries, Inc., Hillsdale, Mich.
Filed Oct. 2, 1975, Ser. No. 618,904
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—235

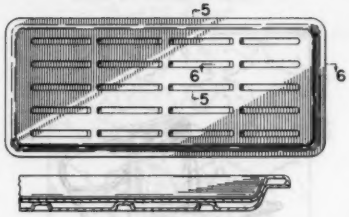
240,711
COMBINED BOTTLE AND CLOSURE
John D. Angleman, Brookside, N.J., and Doris Du Cret, New York, N.Y., assignors to Bristol-Myers Company, New York, N.Y.
Filed Jan. 9, 1975, Ser. No. 539,755
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—10

240,712
EGG CARTON
Bent Moller, Vaerlose, Denmark, assignor to Aktieselskabet Brodrene Hartmann
Filed Mar. 16, 1973, Ser. No. 341,937
Claims priority, application Denmark Feb. 28, 1973
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—190

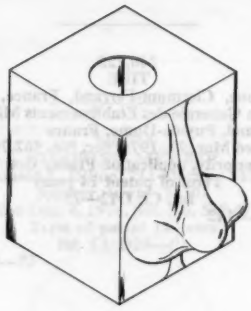
240,713
FOOD CONTAINER
Charles Calvin Barnhart, Hoffman Estates, Ill., and Carroll W. Cassidy, Fenton, Mo., assignors to Standard Container Company, St. Louis, Mo.
Filed Mar. 18, 1974, Ser. No. 451,758
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—219



240,714
FOOD PACKAGING TRAY
Thomas H. White, Statesville, N.C., assignor to Rubbermaid Industrial Products Corporation, Statesville, N.C.
Filed Mar. 3, 1975, Ser. No. 554,757
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—219



240,715
TISSUE BOX COVER OR SIMILAR ARTICLE
Ralph R. Schwartz, 11 Cypress Road, East Chester, N.Y. 10709
Filed June 7, 1973, Ser. No. 367,718
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—259

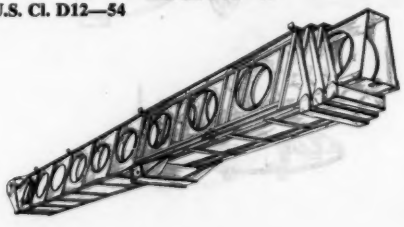


240,716
COMBINED CLOSURE CAP AND POURING SPOUT
Robert Hegi, im Buehl, CH 8113 Boppelsen, Switzerland
Filed Sept. 16, 1974, Ser. No. 505,991
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—278

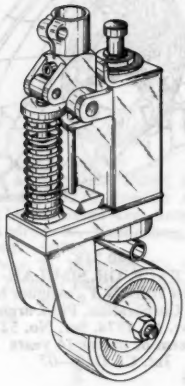
240,717
CLOCK OR SIMILAR ARTICLE
Arthur M. Felske, Westport, Conn., assignor to General Electric Company
Filed Mar. 10, 1975, Ser. No. 556,642
Term of patent 3½ years
Int. Cl. D10—*01*
U.S. Cl. D10—6

240,718
TIMEPIECE FACE OR SIMILAR ARTICLE
Helmut Herz, Forest Hills, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Nov. 14, 1974, Ser. No. 523,942
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—126

240,719
TELESCOPIC CRANE BOOM
Eugene C. Gardenhour, Waynesboro, Pa., and Herbert S. Robins, Hagerstown, Md., assignors to Walter Kidde & Company, Inc., Clifton, N.J.
Filed Apr. 23, 1974, Ser. No. 463,354
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—54



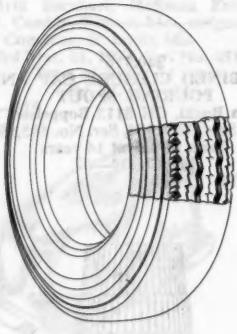
240,720
COMBINED WHEEL AND JACK ASSEMBLY FOR A HAND-OPERATED PALLET TRUCK
Hans Gustav Ingvar Larsson and Sven Gunnar Harald Stjarnqvist, Angelholm, Sweden, assignors to Marco Materialhantering AB
Filed Dec. 27, 1974, Ser. No. 536,806
Claims priority, application Sweden July 1, 1974
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—60



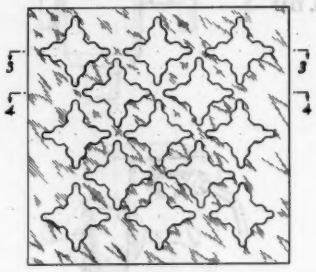
240,721
AIRPLANE
Kenneth L. Bunyard, 45 Oline Drive, Hialeah, Fla. 33010
Filed June 16, 1975, Ser. No. 587,431
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D12—78

240,722
CHILD'S FLEXION WHEELCHAIR
Thomas R. Blue, 17802 Norwood Park, Tustin, Calif. 92680
Filed Nov. 18, 1974, Ser. No. 524,787
Term of patent 14 years
Int. Cl. D12—*12*
U.S. Cl. D12—131

240,723
TIRE
Daniel Lejeune, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, Puy-de-Dome, France
Filed Mar. 27, 1975, Ser. No. 562,791
Claims priority, application France Oct. 7, 1974
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—142

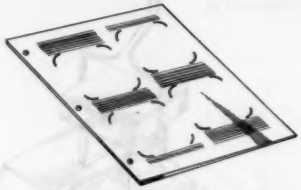


240,724
PERFORATED PANEL
William G. Hale, Lake City, Ark., assignor to Gilbert International, Inc., Jonesboro, Ark.
Filed Nov. 12, 1974, Ser. No. 523,166
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—89

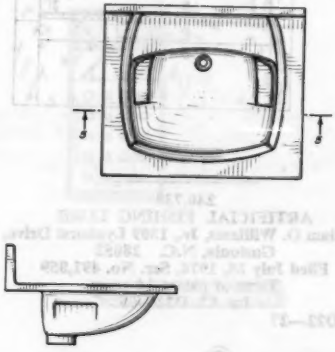


240,725
FLOORING MEMBER
Ronald L. Dillon, 723 Fairway SE., Spencer, Iowa 51301
Filed Dec. 4, 1974, Ser. No. 529,471
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—75

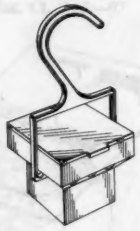
240,726
PHOTO ALBUM PAGE
Stephen F. Harris, Brookline, Mass. (14 Valley Road, Chestnut Hill, Mass. 02167)
Filed June 20, 1974, Ser. No. 481,166
Term of patent 14 years
Int. Cl. D19—*04*
U.S. Cl. D19—33



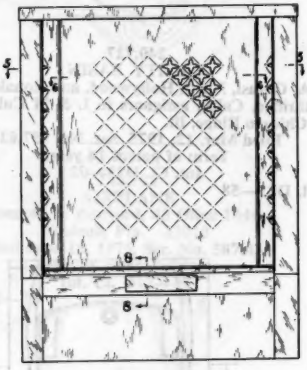
240,727
VANITY BASIN
Louis A. Garasi, North Hollywood, and Ronald F. Hayes, Northridge, Calif., assignors to L & M Cultured Marble, Chicago Ridge, Ill.
Filed Mar. 12, 1975, Ser. No. 557,628
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—58



240,728
BUG BAIT TRAP
Harold A. Lutes, 5128 Coralite St., Long Beach, Calif. 90808
Filed Aug. 4, 1975, Ser. No. 601,794
Term of patent 14 years
Int. Cl. D22—*06*
U.S. Cl. D22—18

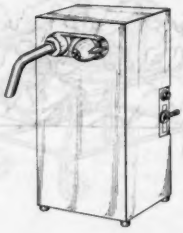


240,729
INSECT TRAP
William G. Hale, Lake City, Ark., assignor to Gilbert International, Inc., Jonesboro, Ark.
Filed Nov. 12, 1974, Ser. No. 523,167
Term of patent 14 years
Int. Cl. D22—*06*
U.S. Cl. D22—19



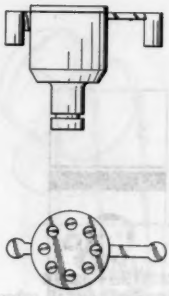
240,730
ARTIFICIAL FISHING LURE
William O. Williams, Jr., 1309 Lynhurst Drive, Gastonia, N.C. 28052
Filed July 25, 1974, Ser. No. 491,859
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

240,731
LIQUID STERILIZER AND DISPENSER
David Free, West Vancouver, British Columbia, and William A. Shand and Wolfgang Scherrelies, Vancouver, British Columbia, Canada, assignors to Naturvard Research (Canada) Ltd., Vancouver, British Columbia, Canada
Filed Apr. 29, 1974, Ser. No. 465,132
Claims priority, application Canada Feb. 15, 1974
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—3

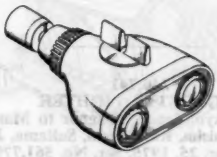


240,732
FLOATING FOUNTAIN
Robert M. Butcher, 295 Country Club Drive, Tequesta, Fla. 33458
Filed July 3, 1975, Ser. No. 592,886
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—13

240,733
LIVE WELL VALVE
William G. Roller, Purdy, Mo., assignor to G & R Industries, Purdy, Mo.
Filed Aug. 19, 1974, Ser. No. 498,433
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19



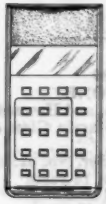
240,734
SHOWER SPRAY HEAD
Milton Halsted, Long Beach, and Tim M. Uyeda, South San Gabriel, Calif., assignors to Chicago Specialty Manufacturing Company, Skokie, Ill.
Filed July 28, 1975, Ser. No. 599,981
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35



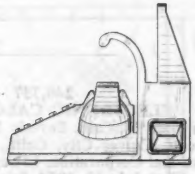
240,735
ELECTRONIC CALCULATOR
Shiro Anzai, Yamato, and Kunio Hirose, Tokyo, Japan, assignors to Canon K.K., Tokyo, Japan
Filed Aug. 5, 1974, Ser. No. 494,915
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D26—5 C

240,736
ELECTRONIC CALCULATOR
John Hunter Pemberton, 17 Fairbairn Road, Cambridge, England
Filed Oct. 21, 1974, Ser. No. 516,439
Claims priority, application Great Britain July 9, 1974
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D26—5 C

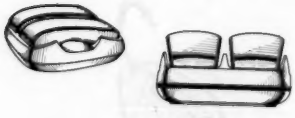
240,737
ELECTRONIC CALCULATOR
Lawrence Glen McCain, Beverly Hills, and Edward William Scott, Culver City, Calif., assignors to Rockwell International Corporation, El Segundo, Calif.
Filed July 10, 1974, Ser. No. 487,061
Term of patent 14 years
Int. Cl. D18—*02*
U.S. Cl. D26—5 C



240,738
PORTABLE ONE-WAY AND TWO-WAY SINGLE COIN OPERATED TELEPHONE FOR INSTITUTIONS, HOSPITALS AND THE LIKE
Susan M. Peoples, 5201 Belleville Ave., Baltimore, Md. 21207
Continuation-in-part of abandoned design application Ser. No. 524,614, Nov. 18, 1974. This application Mar. 11, 1975, Ser. No. 557,261
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 A



240,739
TELEPHONE
Douglas P. Montague, Chicago, and Howard J. Morrison, Deerfield, Ill., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed Oct. 20, 1975, Ser. No. 623,813
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 A



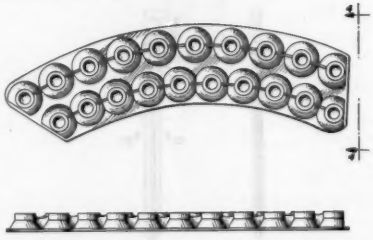
240,740
CIGARETTE PAPER
Kenji Fukushima, 1–14–8 Toneri-cho, Adachi-ku, Tokyo, Japan
Filed Apr. 8, 1974, Ser. No. 458,594
Term of patent 14 years
Int. Cl. D27—*01*
U.S. Cl. D27—1

240,741
CIGARETTE LIGHTER
Kenjiro Goto, Tokyo, Japan, assignor to Mansei Kogyo Kabushiki Kaisha, Kawaguchi, Saitama, Japan
Filed Mar. 25, 1975, Ser. No. 561,779
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—42

240,742
AQUARIUM OR SIMILAR ARTICLE
Tony Robert, 5701 Southwest Freeway, Houston, Tex. 77057
Filed Feb. 24, 1975, Ser. No. 552,051
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—8

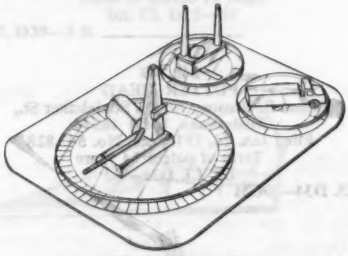
240,743
BIRD FEEDER
Joseph T. Renfro, Jr., 94 Oakwood Drive, Oakwood Knolls, Antioch, Ill. 60002
Filed Feb. 22, 1974, Ser. No. 444,987
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—15

240,744
COVER FOR CUVETTES
Dennis J. Reisdorf, Santa Ana, Calif, assignor to Baxter Laboratories, Inc., Deerfield, Ill.
Filed Oct. 17, 1974, Ser. No. 515,774
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D32—2 C



240,745
ANTHROPOMORPHIC FIGURE
Dorese E. Thulin, 2412 2nd St., Santa Monica, Calif. 90405
Filed Dec. 6, 1974, Ser. No. 530,203
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 R

240,746
GAME BOARD
Rodney L. Smith, 1200 Garland St., Pampa, Tex. 79065
Filed July 29, 1974, Ser. No. 492,888
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS

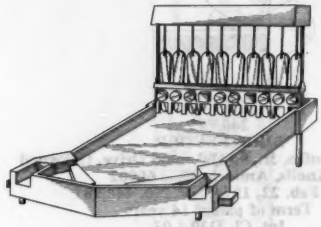


240,747
GAME TABLE
Eero A. T. Paasikallio, Kuopio, Finland, assignor to Veikko Matilainen & K:Ni Ky
Filed Feb. 25, 1974, Ser. No. 445,585
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 J

240,748
GOLF CLUB HEAD
Robert E. Bock, Prospect, Conn., assignor to O. F. Mossberg & Sons, Inc., North Haven, Conn.
Continuation-in-part of abandoned design application Ser. No. 368,237, June 8, 1973. This application Sept. 3, 1974, Ser. No. 502,281
Term of patent 3½ years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH

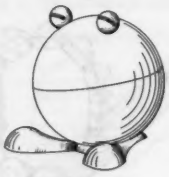
240,749
PUTTER HEAD
Glenn S. Benson, 705 N. Studebaker St., Mishawaka, Ind. 46544
Filed Jan. 24, 1975, Ser. No. 543,828
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH

240,750
TARGET GAME BOARD
Jeffrey D. Breslow, Highland Park, and Michael J. Ferris, Chicago, Ill., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed Apr. 9, 1975, Ser. No. 566,359
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 JJ



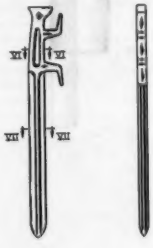
240,751
PUTTER HEAD AND MOUNTING
David L. Taylor, 380 W. Carmel Valley Road, Carmel Valley, Calif. 93924
Filed May 14, 1975, Ser. No. 577,398
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH

240,752
TOY BANK
Sadayasu Miyazaki, 7–9–10 Tateishi, Katsushiki-ku, Tokyo, Japan
Filed Jan. 6, 1975, Ser. No. 538,865
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D34—11 R

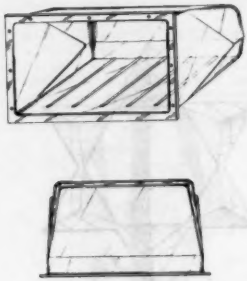


240,753
FLYING TOY
Davey L. Langston, 3616 Mount Vernon, Fort Worth, Tex. 76103
Filed May 23, 1975, Ser. No. 580,369
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—15 W

240,754
GARDEN ROW MARKER
Larry L. Shroyer, 306 Railroad St., Union City, Mich. 49094
Filed Aug. 1, 1974, Ser. No. 493,538
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D35—1

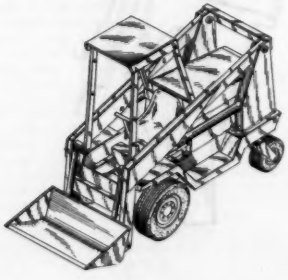


240,755
WINDOW GREENHOUSE
Charles Wheeler Clark, Dumont, and Charles Melvin Dye, Wyckoff, N.J., assignors to RCA Corporation
Filed Oct. 1, 1975, Ser. No. 618,491
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D35—3 R

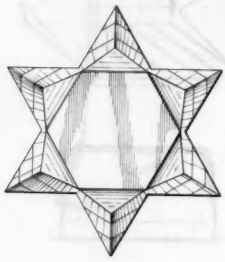


240,756
DIGGER TOOTH
Dwight M. Phillips, Corona Del Mar, Calif., assignor to Corona Forge Company, Corona, Calif.
Filed June 11, 1975, Ser. No. 586,043
Term of patent 14 years
Int. Cl. D15—*04*
U.S. Cl. D39—1 R

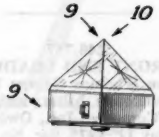
240,757
FRONT END LOADER
J. Craig Henderson, Thomas George Teller, and T. Herbert Morrell, Owatonna, Minn., assignors to Owatonna Manufacturing Company, Inc., Owatonna, Minn.
Filed May 12, 1975, Ser. No. 576,359
Term of patent 14 years
Int. Cl. D15—*04*
U.S. Cl. D40—5



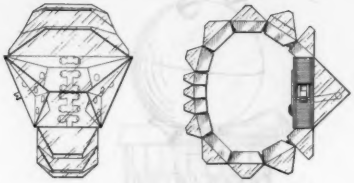
240,758
DIAMOND CUT IN STARFORM
George Saltzmann, Arenbergstraat 40, 2000 Anvers, Belgium
Filed Nov. 27, 1974, Ser. No. 527,820
Claims priority, application Belgium July 30, 1974
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—1 A



240,759
PENDANT
Carl J. Kleiner, 2302 Beach, Cisco, Tex. 76437
Filed Feb. 20, 1974, Ser. No. 444,030
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—16 A

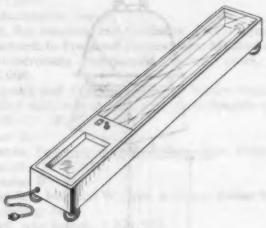


240,760
BRACELET HAVING TRANSPARENT PRISM FACE
Carl J. Kleiner, 2302 Beach, Cisco, Tex. 76437
Filed July 11, 1974, Ser. No. 487,712
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—4 C



240,761
TABLE LAMP
Bruce W. Medford and Mary A. Medford, both of 852 Hopwood Lane, Virginia Beach, Va. 23455
Filed Mar. 20, 1975, Ser. No. 560,246
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 R

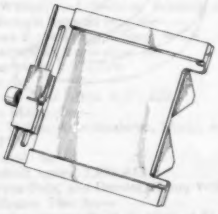
240,762
FLUORESCENT LAMP CREEPER
Roger A. Fraker, 4420 W. Ridge Road, Gary, Ind. 46408
Filed Nov. 25, 1974, Ser. No. 526,511
Term of patent 14 years
Int. Cl. D12—*14;* D26—*99*
U.S. Cl. D48—20 D



240,763
CUTTING TOOL
Richard W. Clemens, Jr., 9201 Wellington Court, Seabrook, Md. 20801
Filed Oct. 4, 1974, Ser. No. 512,054
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D54—4

240,764
ELECTRIC GUITAR OR SIMILAR ARTICLE
Stanley E. Rendell, Kalamazoo, Mich., assignor to Norlin Music, Inc., Lincolnwood, Ill.
Filed Sept. 23, 1974, Ser. No. 508,076
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1 A

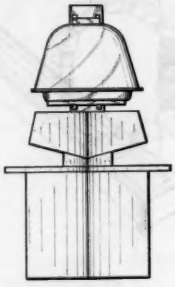
240,765
HOLDER FOR MICROFICHE CARRIERS
Clyde E. LeFevre, Orange, Gregory A. Leland, Huntington Beach, and William R. Swift, Placentia, Calif., assignors to Addressograph-Multigraph Corporation, Cleveland, Ohio
Filed Feb. 6, 1975, Ser. No. 547,631
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—26

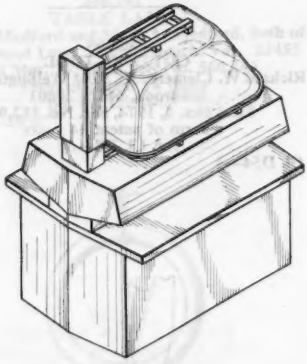


240,766
PHOTOGRAPHIC CAMERA
Rainer Franzmann, Mittelstrasse 24, 2 Norderstedt 2, Germany
Filed Mar. 4, 1975, Ser. No. 555,182
Claims priority, application Germany Sept. 13, 1974
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D16—8

240,767
MEDICAL BASIN
Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840
Filed Feb. 19, 1974, Ser. No. 430,398
Term of patent 3½ years
Int. Cl. D24—*99*
U.S. Cl. D83—1 U

240,768
COMPREHENSIVE INFANT CARE SYSTEM
John W. Beld, O'Fallon, Warren G. Kinninger, Florissant, Robert E. N. Klohr, Fenton, and Paul A. Byrne, St. Louis, Mo., assignors to Puritan-Bennett Corporation, Kansas City, Mo.
Original design application Ser. No. 293,653, Sept. 29, 1972, now Pat. No. 236,165. This application Apr. 11, 1975, Ser. No. 567,181
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D83—1 G





240,769
CONTAINER FOR COSMETICS
Arleen Bowman, 302 W. 12th St., New York, N.Y. 10014
Filed Jan. 16, 1975, Ser. No. 541,635
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D86—10 N

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 27TH DAY OF JULY, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A/S Norclean: *See—*
Renholt, Arnkjell, 3,971,096.

A. Stephan u. Sohne: *See—*
Otto, Friedrich, 3,971,851.

A-T-O Inc.: *See—*
McGill, Robert W., 3,971,190.

AB Profila: *See—*
Peren, Karl Gunnar Magnus; and Svensson, Stig Ake Gosta, 3,971,091.

Abbott Laboratories: *See—*
Prasad, Raj Nandan; and Garmaise, David Lyon, 3,971,849.

Abbott, Richard, to Fruehauf Corporation. Method of making an elongate, transversely reinforced metal sheet. 3,971,688, Cl. 156-295.000.

Abe, Fumiyuki; and Otani, Syuichi, to Nissan Motor Company Limited. Safety seat belt device with an inflatable cushioning means. 3,971,569, Cl. 280-733.000.

Abe, Haruo: *See—*
Tsujimoto, Kayoshi; Matsui, Tohru; Abe, Haruo; and Horimoto, Mitsuaki, 3,972,056.

Abshire, James B.: *See—*
Fitzmaurice, Michael W.; and Abshire, James B., 3,971,930.

ABU Aktiebolag: *See—*
Murvall, Ake Eugen, 3,971,530.

ACF Industries, Incorporated: *See—*
Schlage, Robert E., 3,971,356.

Adams, Francis A. Tool for stripping insulation from multiconductor cables and individual insulated conductors. 3,971,129, Cl. 30-90.100.

Adamson, James R., Jr., to United States of America, Army. Quick disconnect for night vision optics. 3,971,933, Cl. 250-213.0VT.

Addressograph Multigraph Corporation: *See—*
Freericks, Alfred H., 3,972,054.

Aerosols Control Corporation: *See—*
Perez, Manuel, 3,971,642.

AGFA-Gevaert, A.G.: *See—*
Kruger, Wilm; Schatka, Gunther; and Pietruska, Joachim, 3,971,912.
Schneider, Siegfried; Thate, Kurt; Geyken, Erwin; Kempe, Horst; and Macher, Stephan, 3,971,115.

Ahlberg, Erik; Carlvik, Ingvar; Liljekvist, Bernt Soren; and Hagglund, Anders Carl Gustaf, to Sandvik Aktiebolag; and Atlas Copco Aktiebolag. Drill rod for percussion drilling. 3,971,447, Cl. 173-128.000.

Ahrens, Claude W. Pool for teaching swimming to a child. 3,971,076, Cl. 4-172.190.

Aisin Seiki Kabushiki Kaisha: *See—*
Inada, Masami; and Okumura, Shuji, 3,971,406.
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Murakami, Noboru; Matsuo, Koichi; Hirosawa, Koichiro; and Ohara, Kazuo, 3,971,267.
Mufakami, Noboru; Hirosawa, Koichiro; Matsuo, Koichi; and Ohara, Kazuo, 3,971,268.

Ajinomoto Co., Inc.: *See—*
Takinami, Koichi; Tanaka, Takashi; Chiba, Michiaki; and Hirose, Yoshio, 3,971,701.

Akai, Kazuyuki; and Kobayashi, Osamu, to Kabushiki Kaisha Nippon Koinko. Apparatus for automatic supplement of change coins in a coin operated machine. 3,971,393, Cl. 133-2.000.

Akama, Katsushi: *See—*
Sumikama, Sadao; Tanaka, Nobuyoshi; Arakawa, Yoshiaki; and Akama, Katsushi, 3,971,246.

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Akzona Incorporated: *See—*
Paoli, Alfred; and Shah, Bipin J., 3,971,614.
Schurmann, Horst; Bung, Josef; and Van Aalten, Hendrikus Alouisius, 3,971,764.

Albin, Merritt Timothy; and Benton, James W. Bowling ball resurfacing machine. 3,971,164, Cl. 51-129.000.

Albrecht-Buehler, Gunter, to Ciba-Geigy Corporation. Method and apparatus for generating a relieflike contrast at microscopic images of a transparent phase object. 3,971,621, Cl. 350-87.000.

Alcan Aluminum Corporation: *See—*
Daver, Edul M., 3,971,657.

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Cooke, William Ernest, 3,971,501.

Alexson, Peter Charles, to Sea Life Exhibits, Inc. Aquarium apparatus. 3,971,338, Cl. 119-5.000.

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Rogora, Edoardo; and Giraudi, Walter, 3,971,958.

Alford, Andrew. Antenna system for Doppler VOR ground stations. 3,972,044, Cl. 343-106.00D.

Alia, Dominic A., to Okonite Company, The. Electrical cable having an outer sheath with improved pyrolysis properties. 3,971,882, Cl. 174-110.0SR.

Alinder, Gilbert L.: *See—*
Anderson, Lloyd E.; and Alinder, Gilbert L., 3,971,484.

Allan, Roger J.; and Hart, Joseph J., to Container Corporation of America. Sanitary paperboard scoop and container. 3,971,503, Cl. 229-38.000.

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Allied Chemical Corporation: *See—*
Hawkins, Edwin Francis, 3,971,733.

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Allmanna Svenska Elektriska Aktiebolaget: *See—*
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Almagro, Guillermo; Bertorelli, Orlando L.; Mays, Robert K.; Williams, Lloyd E.; and Zimmerman, Howard F., Jr., to J. M. Huber Corporation. Pelletizing alkali metal polysilicates. 3,971,631, Cl. 23-313.0AS.

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Panosh, James L., 3,971,560.

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Kleinberg, Israel; Domokos, Alex; and Castaldi, Cosmo, 3,971,954.

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Aluminum Company of America: *See—*
Brandt, James L.; King, William; Minford, James Dean; and Valchar, Clement E., 3,971,674.
Cochran, C. Norman, 3,971,653.
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Zaffaroni, Alejandro, 3,971,367.

Amalgamated Dental Company Limited, The: *See—*
Hill, Horace Kirby, 3,971,375.

Amano, Yuichi: *See—*
Matsuoka, Chikara; and Amano, Yuichi, 3,971,550.

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Amaya, Akio: *See—*
Murakami, Masao; Amaya, Akio; and Kawakita, Masaru, 3,971,865.

Amaya, Yukio; and Sakakura, Kazufusa, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Circular knitting machine with pattern producing devices. 3,971,233, Cl. 66-50.00R.

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Berst, Albert H.; Wright, Robert; and Kelley, Wilson E., Jr., 3,971,413.

American Home Products Corporation: *See—*
Garsky, Victor M., 3,971,737.
Nudelman, Abraham, 3,971,779.

American Optical Corporation: *See—*
LeBoeuf, Albert R., 3,971,872.
Richards, William; and Grolman, Bernard, 3,971,073.

American Radiologic Systems Inc.: *See—*
Craig, James R.; and Otto, George W., Jr., 3,971,946.

American Videonetics Corporation: *See—*
Vogel, Charles A., 3,972,074.

Aminkemi AB: *See—*
Bresle, Ake Roland Albin, 3,971,628.

Ammazzalorso, Mario: *See—*
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AMP Incorporated: *See—*
Kobler, Robert James, 3,971,613.
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Anaconda Company, The: *See—*
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Anderson, Andrew W., to Scandia Packaging Machinery Company. Conveyor assembly for moving articles. 3,971,467, Cl. 198-164.000.

Anderson, Arnold L.; and Nulph, Robert J., to Michigan Chemical Corporation. Plastic compositions containing acrylonitrile-butadiene-styrene polymer and a bis-phenoxy flame retardant. 3,971,758, Cl. 260-45.9KA.

Anderson, Arnold L., to Michigan Chemical Corporation. Plastic compositions containing polystyrene and a bis-phenoxy flame retardant. 3,971,759, Cl. 260-45.9KA.

Anderson, Arnold L., to Michigan Chemical Corporation. Plastic compositions containing polyurethane and a bis-phenoxy flame retardant. 3,971,760, Cl. 260-45.9KA.

Anderson, Arnold L., to Michigan Chemical Corporation. Plastic compositions containing polyacrylates and a bis-phenoxy flame retardant. 3,971,761, Cl. 260-45.9KA.

Anderson, Arnold L., to Michigan Chemical Corporation. Plastic compositions containing poly(phenylene oxide) and a bis-phenoxy flame retardant. 3,971,762, Cl. 260-45.9KA.

Anderson, Arnold L., to Michigan Chemical Corporation. Plastic compositions containing polyesters and a bis-phenoxy flame retardant. 3,971,763, Cl. 260-45.9KA.

Anderson, Lloyd E.; and Alinder, Gilbert L., to National Carpet Jobbers. Truck mounted carpet handling equipment. 3,971,484, Cl. 214-85.500.

Anderson, Nigel I. Retro-reflective materials. 3,971,692, Cl. 156-241.000.

Anderson, Robert W.: *See—*
Jones, Robert C.; and Anderson, Robert W., 3,971,288.

Anderson, William J., to United States of America, National Aeronautics and Space Administration. Thrust bearing. 3,971,602, Cl. 308-160.000.

Andrea, Christo, to Combustion Engineering, Inc. Anti-leak closure valve. 3,971,482, Cl. 214-27.000.

Andreaggi, Joseph R.; Graf, Robert J.; and Relis, Matthew J., to Andreaggi, Joseph R. System for translating magnetically encoded data to visually readable characters corresponding thereto. 3,972,068, Cl. 360-4.000.

Andressen, Clarence C., to United States of America, Navy. Unitary lasser/IR seeker. 3,971,939, Cl. 250-339.000.

Angelou, Dimitrios I.: *See—*
Kondos, George C.; and Angelou, Dimitrios I., 3,971,310.

Angliker, Hans-Joerg; and Peter, Richard, to Ciba-Geigy AG. Monoazo compounds. 3,971,771, Cl. 260-207.000.

Anop, Ivan. Auxiliary door lock. 3,971,100, Cl. 16-82.000.

Aoyama, Toshikazu; Kimata, Yukinori; Okasaka, Hotuma; Kodama, Hiroshi; and Yoda, Naoya, to Toray Industries, Inc. Flame retarding polyester composition. 3,971,752, Cl. 260-40.00R.

Applied Oceanographic Technology Corporation: *See—*
Husson, Frank, Jr., 3,971,152.

Aprille, Thomas Joseph, Jr., to Bell Telephone Laboratories, Incorporated. Dual feedback amplifier. 3,972,002, Cl. 330-28.000.

Arai, Kazuo, to Nissan Denshi Company Limited. Automatic control system for condition-responsively switching over transceiver and radio or tape recorder audio signals. 3,971,985, Cl. 325-21.000.

Arakawa, Yoshiaki: *See—*
Sumikama, Sadao; Tanaka, Nobuyoshi; Arakawa, Yoshiaki; and Akama, Katsushi, 3,971,246.

Araki, Kunio; Sasaki, Takashi; and Goto, Kazuo, to Nitto Boseki Co.; and Japan Atomic Energy Research Institute. Process for increasing radiation-curability of a radiation-curable resin. 3,971,711, Cl. 204-159.190.

Archer Daniels Midland Company: *See—*
Daftary, Rasik D., 3,971,856.

Archibald, John Leheup; Boyle, John Arnott; and Saunders, John Christopher, to John Wyeth & Brother Limited. (4-Quinolylamino)benzamides. 3,971,787, Cl. 260-286.00R.

Archibald, John Leheup; Boyle, John Terence Arnott; and Saunders, John Christopher, to John Wyeth & Brother Limited. O-(4-Quinolylamino)benzamides. 3,971,789, Cl. 260-286.00R..

Arctic Enterprises, Inc.: *See—*
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Arima, Keizi: *See—*
Takashima, Kiyoshi; Arima, Keizi; Shozi, Takeshi; and Mori, Hisashi, 3,971,655.

Armco Steel Corporation: *See—*
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Armellino, Richard A. Lightweight armor and method of fabrication. 3,971,072, Cl. 2-2.500.

Arnaud, Jean-Claude: *See—*
Bore, Pierre; Arnaud, Jean-Claude; and Kalopissis, Gregoire, 3,971,391.

Arnott, Robin A.: *See—*
Hedgewick, Peter; Suhr, Donald C.; Domaracki, John F.; and Arnott, Robin A., 3,971,623.

Arrington, William Marshall, to International Business Machines Corporation. Portable recorder control apparatus. 3,972,071, Cl. 360-86.000.

Artamonov, Viktor Leonidovich: *See—*
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Shtanko, Jury Pavlovich; Tsukanov, Georgy Emmanuilovich; Bogachenko, Alexei Georgievich; Bondarenko, Oleg Petrovich; Martyn, Viktor Mikhailovich; Baglai, Vitaly Mikhailovich; Stupak, Leonid Mikhailovich; Artamonov, Viktor Leonidovich; and Pavliichuk, Georgy Anatolievich, 3,971,430.

Artz, Klaus: *See—*
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Asakawa, Takeki: *See—*
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Asano, Setunobu; Nakamura, Tadashi; and Yamamoto, Yasuo, to Mitsubishi Gas Chemical Company, Inc. Methanol production catalyst and process for preparing the same. 3,971,735, Cl. 252-432.000.

Asbeck, Adolf: *See—*
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Aspelin, Gary B.; and Smith, James T., to Johnson & Johnson. Folded cup-like surgical face mask and method of forming the same. 3,971,369, Cl. 128-146.200.

Atlantic Products Corporation: *See—*
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Atlantic Richfield Company: *See—*
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Atumi, Shiro; and Yamada, Kozo, to Oki Electric Industry Company, Ltd. Compensation apparatus for high speed dot printer. 3,972,052, Cl. 337-.

Automobiles Peugeot: *See—*
Froumajou, Armand, 3,971,349.

Avrahami, Zohar: *See—*
Seidman, Ady; Avrahami, Zohar; Sheinfux, Benjamin; Grinberg, Jan; and Shimoni, Uri, 3,971,942.

B A Installationsutveckling AB: *See—*
Persson, Bengt Arne, 3,971,401.

B-Cubed Engineering, Inc.: *See—*
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Babson Brothers Company: *See—*
Swanson, Roger; Thompson, Duncan M.; and Shulick, Robert J., 3,971,720.

Bachmann, Klaus Jurgen; Nagel, Suzanne Rose; Pearson, Arthur David; Schmidt, Paul Herman; and Tynes, Arthur Richard, to Bell Telephone Laboratories, Incorporated. Method of making compound-glass optical waveguides fabricated by a metal evaporation technique. 3,971,645, Cl. 65-3.00A.

Bachmann, Robert; Bearda, Pieter; Stoidl, Walter; Brandli, Gerold; and Rieder, Rudolf, to BBC Brown Boveri & Company Limited. Ultraviolet radiation source including temperature control and pressure control operating means. 3,971,968, Cl. 315-108.000.

Bachner, George L., to Nimco Corporation. Apparatus for ultrasonic sealing of non-uniform folded carton bottom closure. 3,971,300, Cl. 93-36.300.

Bachofer, Henry L., to Sun Oil Company of Pennsylvania. Mechanical testing system. 3,971,249, Cl. 73-67.000.

Back, Gerhard: *See—*
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Bagger-en Constructie Bedrijf Johan Klip B.V.: *See—*
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Bailey, Myrl Kennedy, Jr., to Honeywell Information Systems, Inc. Concurrent microprocessing control method and apparatus. 3,972,029, Cl. 340-172.500.

Bailey, Myrl Kennedy, Jr., to Honeywell Information Systems, Inc. Peripheral control capable of dynamically executing command sequences. 3,972,030, Cl. 340-172.500.

Bailly, Roger: *See—*
Ballini, Andre; and Bailly, Roger, 3,971,111.

Baker, Don R., to Stauffer Chemical Company. S-methyl-N-[4-(4'-chlorophenoxy)phenyl] thiolcarbamate. 3,971,649, Cl. 71-100.000.

Baker, Don R.; and Walker, Francis H., to Stauffer Chemical Company. N-substituted-N-(1-substituted-1-methyl-2-propynyl)-α-(substituted phenoxy) alkylamides and their use as miticides. 3,971,850, Cl. 424-324.000.

Baker, Halsted W.; and Gottfried, Arthur H., to United States of America, Army. Internally-focused traveling wave tube. 3,971,965, Cl. 315-3.500.

Baker Oil Tools, Inc.: *See—*
Crowe, Talmadge L., 3,971,438.

Baker, Richard H., to Massachusetts Institute of Technology. Electric power supply. 3,971,976, Cl. 321-4.000.

Ball, Herbert: *See—*
Ohl, Wolf; and Ball, Herbert, 3,971,897.

Ballini, Andre; and Bailly, Roger, to Regie Nationale des Usines Renault. Apparatus for transferring and finishing items cast several at a time in a chill mold. 3,971,111, Cl. 29-38.00C.

Bank, Howard M.; and Michael, Keith W., to Dow Corning Corporation. Curable compositions. 3,971,747, Cl. 260-37.0SB.

Banner, Philip M. Fishing hook holding means. 3,971,151, Cl. 43-24.000.

Banyasz, Bela: *See—*
Heiges, Melville Lynwood, Jr.; Golding, Leonard; and Banyasz, Bela, 3,972,065.

Bara, Edwin Stanley, to Motorola, Inc. Automatic tape cartridge ejection mechanism for multitrack cartridge players. 3,972,073, Cl. 360-93.000.

Baran, John S.; and Pitzele, Barnett S., to G. D. Searle & Co. Manufacture of poly-(cis)-isoprenols. 3,971,827, Cl. 260-526.00N.

Barlow, Robert M.: *See—*
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Barmag Barmer Maschinenfabrik Aktiengesellschaft: *See—*
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Barnish, Ian Thompson; Cox, David Alexander; and Evans, Anthony Garth, to Pfizer Inc. 4-Aminoquinazoline derivatives as cardiac stimulants. 3,971,783, Cl. 260-256.40Q.

Baron, George B.; and Padrutt, Paul W., to Marion Power Shovel Company, Inc. Power shovel and crowd system therefor. 3,971,215, Cl. 60-403.000.

Barrera, Roberto Gonzalez: *See—*
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Barrett, John Albert: *See—*
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Barrett, Joseph Edward, to British Petroleum Company Limited, The. Protection method. 3,971,223, Cl. 61-36.00R.

Barton, Glenn B. Variable angle cut-off saw. 3,971,274, Cl. 83-100.000.

Barton, Lee C.: *See—*
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BASF Aktiengesellschaft: *See—*
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Baumann, Hans; Grychtol, Klaus; and Oberlinner, Andreas, 3,971,821.

BASF Wyandotte Corporation: *See—*
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Bassett, Edward James, to Seismograph Service Corporation. Time synchronization. 3,972,019, Cl. 340-15.5TS.

Bat Weight, Inc.: *See—*
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Batzer, Richard R.; and Redmond, John D., to Gates Rubber Company, The. Cotton doffer. 3,971,197, Cl. 56-41.000.

Bauer, Andreas, to Volkswagenwerk Aktiengesellschaft. Frame for the body of a vehicle. 3,971,588, Cl. 296-28.00R.

Bauer, Benjamin B., to CBS Inc. Method and apparatus for quadraphonic enhancement of stereophonic signals. 3,971,890, Cl. 179-1.0GQ.

Bauer, Friedrich, to Hoerbiger Ventilwerke Aktiengesellschaft. Pressure regulator for pneumatic systems. 3,971,409, Cl. 137-613.000.

Baumann, Dieter: *See—*
Porret, Daniel; Habermeier, Jurgen; and Baumann, Dieter, 3,971,813.

Baumann, Hans; and Oberlinner, Andreas, to BASF Aktiengesellschaft. Spirodipyrans and chromogenic materials for copying processes. 3,971,808, Cl. 260-345.200.

Baumann, Hans; Grychtol, Klaus; and Oberlinner, Andreas, to BASF Aktiengesellschaft. Production of aminobenzaldehydes. 3,971,821, Cl. 260-465.00E.

Baumann, Hans D., to Masoneilan International, Inc. Variable resistance type throttling trim. 3,971,411, Cl. 137-625.300.

Baxter Laboratories, Inc.: *See—*
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Bayer Aktiengesellschaft: *See—*
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Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 3,971,791.
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Bayerische Berg-, Hutten- und Salzwerke AG: *See—*
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BBC Brown Boveri & Company Limited: *See—*
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Beasley, Donald L.: *See—*
Townsend, Ray T.; and Beasley, Donald L., 3,971,101.

Beaudoin, Guy; and Vincent, Marcel. Variable diameter pulley with means for changing wear pattern on the pusher ring. 3,971,263, Cl. 74-230.17E.

Becker, Klaus; and Sprung, Hartwig, to Demag Aktiengesellschaft. Housing, including readily removable protective plates, for monorail electrical components. 3,971,459, Cl. 191-30.000.

Becker, Reinhold; Hennecken, Manfred; and Zimmerman, Hans-Georg, to Hoechst Aktiengesellschaft. Process for the production of the closure of a hollow stick of shirred sausage casing . 3,971,301, Cl. 93-84.0TW.

Becker, Wolf; and Weiss, Wolfgang, to Bayer Aktiengesellschaft. Recovery of hydrofluoric acid from aqueous fluosilicic acid. 3,971,845, Cl. 423-483.000.

Beckman Instruments, Inc.: *See—*
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Becorit Grubenausbau GmbH: *See—*
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Beestrice, William R.; Cherenko, Joseph; and Frey, William I., to PPG Industries, Inc. Polyurethane laminates. 3,971,864, Cl. 428-423.000.

Beiswenger, Richard W., to Teledyne Mid-America Corporation. Tamping blade and a hard wear-resistant insert therefor. 3,971,323, Cl. 104-10.000.

Bell & Howell Company: *See—*
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Bell, Larry N.: *See—*
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Bell, Reuben H.: *See—*
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Bell Telephone Laboratories, Incorporated: *See—*
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Bachmann, Klaus Jurgen; Nagel, Suzanne Rose; Pearson, Arthur David; Schmidt, Paul Herman; and Tynes, Arthur Richard, 3,971,645.
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Faust, Carl Walter; and Smith, Arnold Ray, 3,971,894.
Giguere, Winfield Joseph; and Padnes, David Richard, 3,971,127.
Gopinath, Bhaskarpillai; and Kurshan, Robert Paul, 3,971,998.
Hess, William Emil, Jr.; and Vella-Coleiro, George Philip, 3,972,037.
Schroeder, Paul Robert, 3,972,003.

Bellanger, Maurice Georges; and Daguet, Jacques Lucien, to Telecommunications Radioelectriques et Telephoniques T.R.T. Circuit arrangement for digitally processing a given number of channel signals. 3,971,922, Cl. 235-152.000.

Bellsmith, Joseph L. Portable spark plug cleaner. 3,971,162, Cl. 51-8.0SP.

Bench, Stephen Michael, to B-Cubed Engineering, Inc. Wide-range logarithmic responding translation circuit. 3,971,984, Cl. 324-132.000.

Bendix Corporation, The: *See—*
Jeunehomme, Michel L.; and Essad, Robert A., 3,971,943.
Johnson, Robert P., 3,971,920.
Luchaco, David G.; and Peterson, William A., Jr., 3,971,354.

Bene, Armand Jean. Apparatus for treating an elongated web with a liquid. 3,971,236, Cl. 68-176.000.

Beneke Division, Beatrice Foods Co.: *See—*
O'Neil, Robert, 3,971,077.

Benn, Robert E., to Burroughs Corporation. Self-scanning electrostatic print head for a dot matrix printer. 3,971,465, Cl. 197-1.00R.

Bennett, Richard H.: *See—*
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Benton, James W.: *See—*
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Bentsen, Louis J., to Honeywell Inc. Pneumatic relay. 3,971,396, Cl. 137-82.000.

Beppu, Norio: *See—*
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Bergensten, Robert W.: *See—*
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Berst, Albert H.; Wright, Robert; and Kelley, Wilson E., Jr., to American Air Filter Company, Inc. Damper arrangement. 3,971,413, Cl. 137-630.140.

Bertolini, William A.; and Feinberg, Isadore. Method of assembling shipping container. 3,971,122, Cl. 29-469.000.

Bertorelli, Orlando L.; Mays, Robert K.; Williams, Lloyd E.; and Zimmerman, Howard F., Jr., to J. M. Huber Corporation. Alkali metal polysilicates, methods for their production and detergent compositions employing same. 3,971,727, Cl. 252-135.000.

Bertorelli, Orlando L.: *See—*
Almagro, Guillermo; Bertorelli, Orlando L.; Mays, Robert K.; Williams, Lloyd E.; and Zimmerman, Howard F., Jr., 3,971,631.

Bethlehem Steel Corporation: *See—*
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Bialczak, Edward C. Light-sensitive diazotype with yellow diazo couplers. 3,971,663, Cl. 96-91.00R.

Bialous, Charles A.; Luce, John B.; and Mark, Victor, to General Electric Company. Flame retardant polycarbonate composition. 3,971,756, Cl. 260-45.70R.

Bien, Hans-Samuel: *See—*
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Biggs, James W.: *See—*
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Meeks, Lawrence A.; and Biggs, James W., 3,971,884.

Bill J. Hays International Inc.: *See—*
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Billows, Leonard Kay. Picture composing techniques and apparatus therefor. 3,971,276, Cl. 83-164.000.

Bilsens, Gunars; and Figueroa, Raymond Oscar, to Motorola, Inc. Coherent phase demodulator for phase shift keyed suppressed carrier signals. 3,971,999, Cl. 329-105.000.

Bindra, Jasjit S.: *See*—
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Birnkraut, Hans-Walter; and Kluy, Werner, to Ruhrchemie Aktiengesellschaft. Process for adhesive bonding and coating. 3,971,690, Cl. 156-309.000.

Bjerk, Roger Odell, to Caterpillar Tractor Co. Thrust bearing lubrication. 3,971,603, Cl. 308-168.000.

Black, Robin Michael: *See*—
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Blaha, Eli W.: *See*—
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Blahak, Johannes: *See*—
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Blain, Jim W., to United States of America, Navy. Explosive linear cutter. 3,971,290, Cl. 89-1.00B.

Blake, John L., Jr.: *See*—
Schickling, Joseph H.; Blake, John L., Jr.; and Hyduk, Walter, 3,971,565.

Blaude, Joseph Emile Albert; and Duchateau, Georges Francois Michel Frederic, to Raffinerie Tirlemontoise. Installation for treating sugar-mill molasses. 3,971,667, Cl. 127-9.000.

Block, Hans-Jurgen, to Hauni-Werke Korber & Co., KG. Method and apparatus for the production of filter plugs. 3,971,695, Cl. 156-461.000.

Blodgett, Francis E.; and Campagnuolo, Carl J., to United States of America, Army. Fluid driven electrical-mechanical safety and arming system. 3,971,321, Cl. 102-81.000.

Bloom, Stanley. Urine-sensing pad. 3,971,371, Cl. 128-138.00A.

Blue, James W., to United States of America, National Aeronautics and Space Administration. Production of ^{123}I. 3,971,697, Cl. 176-11.000.

Blunt, Harry W., to Hercules Incorporated. Method of preparing small particles of polypropylene. 3,971,749, Cl. 260-33.4PQ.

Bodner, Ronald E.; Cianciosi, Mario N.; Crooks, Thomas L.; Magrisso, Israel B.; Slack, Keith K.; and Smith, Richard S., to International Business Machines Corporation. I/O data transfer control system. 3,972,023, Cl. 340-172.500.

Bodocsi, Andrew; Hoge, John H.; Hubbard, John H.; Hubbard, S. Jackson; and Roberto, Gerard. Non-bonded framing system. 3,971,179, Cl. 52-223.00R.

Boeing Company, The: *See*—
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Boel, Charles; Cottin, Jean-Pierre; and Guitard, Francois, to Houilleres du Bassin du Nord et du Pas-de-Calais. Factory-made habitation cell. 3,971,175, Cl. 52-79.000.

Boesten, Wilhelmus H. J., to Stamicarbon B.V. Process for the enzymatic resolution of DL-phenyl glycine amide into its optically active antipodes. 3,971,700, Cl. 195-2.000.

Bogachenko, Alexei Georgievich: *See*—
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Shtanko, Jury Pavlovich; Tsukanov, Georgy Emmanuilovich; Bogachenko, Alexei Georgievich; Bondarenko, Oleg Petrovich; Martyn, Viktor Mikhailovich; Baglai, Vitaly Mikhailovich; Stupak, Leonid Mikhailovich; Artamonov, Viktor Leonidovich; and Pavliichuk, Georgy Anatolievich, 3,971,430.

Boileau, Jacques, to Compagnie Generale des Etablissements Michelin. Tire tread. 3,971,424, Cl. 152-209.00R.

Bokros, Jack C., to General Atomic Company. Carbon dental implant with artificial periodontal ligament. 3,971,134, Cl. 32-10.00A.

Bolter, Bernard J.: *See*—
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Bolth, Franklin Anderson: *See*—
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Bondarenko, Oleg Petrovich: *See*—
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Shtanko, Jury Pavlovich; Tsukanov, Georgy Emmanuilovich; Bogachenko, Alexei Georgievich; Bondarenko, Oleg Petrovich; Martyn, Viktor Mikhailovich; Baglai, Vitaly Mikhailovich; Stupak, Leonid Mikhailovich; Artamonov, Viktor Leonidovich; and Pavliichuk, Georgy Anatolievich, 3,971,430.

Bonucci, Peter A., to Northrup, King & Co. Production of hybrid sweet corn. 3,971,161, Cl. 47-58.000.

Bore, Pierre; Arnaud, Jean-Claude; and Kalopissis, Gregoire, to L'Oreal. Process for improving the quality of living, human hair by lanthionization. 3,971,391, Cl. 132-7.000.

Borell, James J. Guitar string supporting device. 3,971,286, Cl. 84-298.000.

Bossert, Friedrich; Wehinger, Egbert; Vater, Wulf; and Stoepel, Kurt, to Bayer Aktiengesellschaft. 1,4-Dihydropyridine esters. 3,971,796, Cl. 260-294.80F.

Bossert, Friedrich: *See*—
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 3,971,790.
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 3,971,791.

Bourgery, Guy R.: *See*—
Fauran, Claude P.; Eberle, Jeannine A.; Bourgery, Guy R.; Raynaud, Guy M.; and Pourrias, Bernard M., 3,971,793.

Bourne, Richard Curtis. Louvered selective solar energy collector. 3,971,359, Cl. 126-270.000.

Bowen, Robert B.; Maier, Roger F.; and Rediger, John R., to Caterpillar Tractor Co. Environmental seals for multidirectional control levers. 3,971,564, Cl. 277-30.000.

Bowles, Arnold G.: *See*—
Witkin, Donald E.; and Bowles, Arnold G., 3,971,876.

Bowser, George H.: *See*—
Mazzoni, Renato J.; Bowser, George H.; and Lewchuk, Richard R., 3,971,178.

Box, Theodor Max. Skatewheel conveyor pallet. 3,971,314, Cl. 104-135.000.

Boyajian, Alfred Z.; and Don, Jules M., to Stanley Works, The. Straight pattern snips. 3,971,131, Cl. 30-260.000.

Boyle, John Arnott: *See*—
Archibald, John Leheup; Boyle, John Arnott; and Saunders, John Christopher, 3,971,787.

Boyle, John Terence Arnott: *See*—
Archibald, John Leheup; Boyle, John Terence Arnott; and Saunders, John Christopher, 3,971,789.

Brack, Alfred, to Bayer Aktiengesellschaft. Cationic dyestuffs. 3,971,807, Cl. 260-326.900.

Bradshaw, Janice: *See*—
Cook, Martin Christopher; Gregory, Gordon Ian; and Bradshaw, Janice, 3,971,778.

Brandli, Gerold: *See*—
Bachmann, Robert; Bearda, Pieter; Stoidl, Walter; Brandli, Gerold; and Rieder, Rudolf, 3,971,968.

Brando, Pasquale: *See*—
Silvestri, Antonio; and Brando, Pasquale, 3,971,228.

Brandt, James L.; King, William; Minford, James Dean; and Valchar, Clement E., to Aluminum Company of America. Selective black coating for aluminum. 3,971,674, Cl. 148-6.270.

Brather, Wolfgang; and Hahn, Alfred, to Siemens Aktiengesellschaft. Operative location for the examination of patients by means of X-rays. 3,971,949, Cl. 250-446.000.

Braun, David L., to Minnesota Mining and Manufacturing Company. Particle-loaded microfiber sheet product and respirators made therefrom. 3,971,373, Cl. 128-146.200.

Bredow, Walter; Tamaschke, Walter; and Rott, Gunther. Angle shears with divided shear cutting members. 3,971,281, Cl. 83-519.000.

Brehmer, Kurt A., to Carl Brehmer & Sohn, Firma. Hairpiece, particularly a toupet, and process for making same. 3,971,392, Cl. 132-53.000.

Brenner, Joseph; Henderson, Gary H.; and Bergensten, Robert W., to Polak's Frutal Works, Inc. Process of encapsulating an oil and product produced thereby. 3,971,852, Cl. 426-103.000.

Bresle, Ake Roland Albin, to Aminkemi AB. Method for inhibiting rust formation on iron-containing articles. 3,971,628, Cl. 21-2.70R.

Breslow, David S., to Hercules Incorporated. Epoxy-azido compounds. 3,971,627, Cl. 8-115.500.

Breslow, David S., to Hercules Incorporated. Epoxy-azido compounds. 3,971,743, Cl. 260-3.300.

Breslow, Jeffrey D.; and Jaworski, Eugene, to Marvin Glass & Associates. Chance amusement device. 3,971,557, Cl. 273-1.00E.

Bridgeman, Cecil K., to Picker X-Ray Mfg. Limited. X-ray table. 3,971,953, Cl. 250-469.000.

Briggs & Stratton Corporation: *See*—
Harkness, Joseph R.; and Couchman, Robert, Jr., 3,971,353.

Brion, Frank R.: *See*—
Evans, David T.; Proctor, Ellen M.; Brion, Frank R.; and Ceelen, Theodorus M., 3,971,950.

Briska, Marian; Hoffmeister, Wolfgang; and Kuhlmey, Herbert, to International Business Machines Corporation. Method of etching materials containing silicon. 3,971,683, Cl. 156-13.000.

British Petroleum Company Limited, The: *See*—
Barrett, Joseph Edward, 3,971,223.

Brodie, Wilfred Spry. Log bundling apparatus and method of bundling logs. 3,971,309, Cl. 100-2.000.

Broers, Alec N.; and Sedgwick, Thomas O., to International Business Machines Corporation. Method for making device for high resolution electron beam fabrication. 3,971,860, Cl. 427-43.000.

Bron, Dan. Automatic proportioner for low-pressure watering troughs. 3,971,341, Cl. 119-72.000.

Brooks, James L.: *See*—
Huang, Kwang Ta; and Brooks, James L., 3,971,878.

Broughton, Glover F.: *See*—
Tardiff, Armand L.; Broughton, Glover F.; Delorey, David R.; and Pearson, Bangt R., 3,971,193.

Brown, Charles W.: *See*—
Wiese, Frank D.; Link, Donald F.; and Brown, Charles W., 3,971,306.

Brown, Claud Lafayette; and Enos, Herman Isaac, Jr., to Hercules Incorporated. Treatment of conifers. 3,971,159, Cl. 47-10.000.

Brown, Gordon Eugene: *See*—
Crover, Stephen Earl; and Brown, Gordon Eugene, 3,971,448.

Brown, Richard E., to Warner-Lambert Company. Indolothiopyrones. 3,971,806, Cl. 260-326.280.

Brown, William A. Weld clamp seal. 3,971,579, Cl. 285-353.000.

Brownlee, Robert R.; Tyers, Frank O.; and Volz, Carl, Sr., to Research Company. Pacemaker low current pulse generator. 3,971,389, Cl. 128-419.0PG.

Bruderly, Roland L.; and Tomayko, Edward A., to Bruderly, Roland L. Framing and modular base unit structure for display fixtures. 3,971,477, Cl. 211-189.000.

Bruesch, Peter; Lehmann, Fritz; Schuler, Claus; and Zeller, Hans-Rudolf, to BBC Brown Boveri & Company Limited. Controllable electrochromic indicator device with ionic conducting intermediate layer and non-polarizable electrodes. 3,971,624, Cl. 350-160.00R.

Brugger-Stuker, Ruth, to Panta AG. Combination ski boot and walking sole and connection means for such combination. 3,971,144, Cl. 36-100.000.

Bruner, A. J. Animal crossing guard. 3,971,546, Cl 256-14.000.

Brunlid, John-Erik: *See*—
Soukup, Franz; Rosberg, Bengt A.; Larsson, Tore I.; and Brunlid, John-Erik, 3,971,192.

Bryson, Joseph Lindsey, deceased (by Bryson, Margaret Monteith, administratrix), to Metallurgical Development Company. Ammoniacal extraction of copper from metallic materials. 3,971,652, Cl. 75-.50A.

Bryson, Margaret Monteith, administratrix: *See*—
Bryson, Joseph Lindsey, deceased, 3,971,652.

Buchele, Wesley F., to Iowa State University Research Foundation, Inc. Blade guard for rotary lawn mowers. 3,971,199, Cl. 56-320.200.

Buchoff, Leonard S.; Kosiarski, Joseph P.; and Dalamangas, Chris A., to Technical Wire Products, Inc. Conductive elastomeric contacts and connectors. 3,971,610, Cl. 339-17.00R.

Buckbee-Mears Company: *See*—
Frantzen, John J.; and Barton, Lee C., 3,971,682.

Budke, Robert L.; and Freeborn, Lowell C., to Systi-Matic Company. Pre-sharpened cutting tip for saw plate. 3,971,113, Cl. 29-95.00R.

Buhrer, Carl F., to GTE Laboratories Incorporated. Method of fabricating magnetic field drive coils for field accessed cylindrical domain memories. 3,971,126, Cl. 29-604.000.

Buix, Louis F.; Gribnitz, Harry J.; and Hohner, Gary A., to Quaker Oats Company, The. Retorting tray. 3,971,629, Cl. 21-105.000.

Bung, Josef: *See*—
Schurmann, Horst; Bung, Josef; and Van Aalten, Hendrikus Alouisius, 3,971,764.

Burger, John H.; McClelland, John R.; and Dunkle, Robert P., to Armco Steel Corporation. Method of annealing oriented silicon steel. 3,971,679, Cl. 148-113.000.

Burgess Vibrocrafters, Inc.: *See*—
Querfurth, William M.; Schwartz, Michael A.; and Wiltberger, Jon C., 3,971,130.
Simmons, Frank A., 3,971,408.

Burke, Robert: *See*—
Griffith, Robert E., Jr., 3,971,222.

Burkle, William C.; and Eilo, Clyde W., to Hercules Incorporated. Explosive assembly comprising a tubular member formed of water-soluble plastic. 3,971,318, Cl. 102-24.00R.

Burroughs Corporation: *See*—
Benn, Robert E., 3,971,465.
Lundquist, David E.; McGregor, Arvin D.; and Hoffman, Paul R., 3,972,051.
Schroeder, Franklin T.; and McAllister, John P., 3,972,024.
Sprenkle, George J., 3,971,419.
Taddei, Vincent J., 3,972,025.

Bush, Harley E., to NL Industries, Inc. Sulfite compositions, aqueous sulfite solutions and method of decreasing their rate of oxidation. 3,971,734, Cl. 252-389.00A.

Bussard, Charles B., to Monarch Marking Systems, Inc. Tag attaching apparatus. 3,971,498, Cl. 227-67.000.

Byrne, John Frank, to Xerox Corporation. Method for repairing selenium photoreceptors. 3,971,169, Cl. 51-283.000.

C. L. Frost & Son, Inc.: *See*—
Sytsma, Frederick R., 3,971,601.

Cain, Earl S.: *See*—
Goodrich, George E., Jr.; Cain, Earl S.; Goodrich, George E., Sr.; Gilding, Denis Keith; and Carlson, Jerome A., 3,971,499.

Cairns, Michael John, to Hercules Incorporated. Apparatus for film application. 3,971,691, Cl. 156-497.000.

Cake, William R.: *See*—
Schneider, Charles A.; and Cake, William R., 3,971,680.

Calkins, Thornton R., to General Electric Company. Coated heat fusible injection moldable phenol-aldehyde pellets. 3,971,863, Cl. 428-407.000.

Campagnolo, Tullio. Wheel hub disc brake. 3,971,457, Cl. 188-18.00A.

Campagnuolo, Carl J.: *See*—
Blodgett, Francis E.; and Campagnuolo, Carl J., 3,971,321.

Canon Kabushiki Kaisha: *See*—
Ichiyanagi, Toshikazu, 3,971,974.
Ishii, Masaaki, 3,971,523.
Ozawa, Masayoshi; Machida, Minoru; Kawabata, Yoichi; and Seki, Mitsuaki, 3,971,924.

Carborundum Company, The: *See*—
Economy, James; Lin, Ruey Y.; and Smith, William D., 3,971,840.

Carl Brehmer & Sohn, Firma: *See*—
Brehmer, Kurt A., 3,971,392.

Carli, Othmar. Adjustable squeegee holding device for silkscreen printing frame. 3,971,312, Cl. 101-114.000.

Carlson, Jerome A.: *See*—
Goodrich, George E., Jr.; Cain, Earl S.; Goodrich, George E., Sr.; Gilding, Denis Keith; and Carlson, Jerome A., 3,971,499.

Carlson, Robert C.; and Stoskopf, Albert H., to Minnesota Mining and Manufacturing Company. Amino terminated ionic polyurethane emulsion with polyepoxide emulsion. 3,971,745, Cl. 260-29.2TN.

Carlsson, Ingemar, to Lihnell Vagn AB. Apparatus for handling and transporting containers, load supporting bodies, pallets and the like. 3,971,486, Cl. 214-505.000.

Carlvik, Ingvar: *See*—
Ahlberg, Erik; Carlvik, Ingvar; Liljekvist, Bernt Soren; and Hagglund, Anders Carl Gustaf, 3,971,447.

Carroll, Paul E.; Moore, Warren, Jr.; and Voigt, William C., to Texas Instruments Incorporated. Transformerless input for seismic data acquisition system. 3,972,020, Cl. 340-15.5AF.

Carrubba, Francis P.; Franaszek, Peter A.; and Grossman, David D., to International Business Machines Corporation. Gain method and apparatus for a delta modulator. 3,971,987, Cl. 325-38.00B.

Carty, Daniel T.: *See*—
Myers, Robert M.; Dunkelberger, David L.; and Carty, Daniel T., 3,971,835.

Casey, Anthony Joseph. Cabin heater for helicopters and fixed wing aircraft. 3,971,511, Cl. 237-12.30A.

Castaldi, Cosmo: *See*—
Kleinberg, Israel; Domokos, Alex; and Castaldi, Cosmo, 3,971,954.

Caterpillar Tractor Co.: *See*—
Bjerk, Roger Odell, 3,971,603.
Bowen, Robert B.; Maier, Roger F.; and Rediger, John R., 3,971,564.
Conroy, William E.; Ehlke, Charles C.; and Sidles, Peter, Jr., 3,971,461.

Causer, Roy: *See*—
Whittle, Harry Reed; Lee, Michael John; and Causer, Roy, 3,971,299.

Caveney, Jack E., to Panduit Corporation. Mount for flat objects such as flat cables. 3,971,105, Cl. 24-16.0PB.

Cawrse, Richard S. Apparatus and method for applying lids to containers. 3,971,188, Cl. 53-39.000.

CBS Inc.: *See*—
Bauer, Benjamin B., 3,971,890.

Ceelen, Theodorus M.: *See*—
Evans, David T.; Proctor, Ellen M.; Brion, Frank R.; and Ceelen, Theodorus M., 3,971,950.

Cerelli, George S.: *See*—
Martinelli, Luigi E.; and Cerelli, George S., 3,971,514.

Ceskoslovenska akademie ved: *See*—
Hudecek, Slavko; and Gavrilova, Ivana, 3,971,744.
Lochmann, Lubomir; and Trekoval, Jiri, 3,971,816.
Wichterle, Otto, 3,971,376.

Chaivre, Joseph W., to Towne Robinson Fastener Company. Wheel nuts. 3,971,289, Cl. 85-35.000.

Chamberlin, Thomas A.: *See*—
Kochanny, Gerald L., Jr.; and Chamberlin, Thomas A., 3,971,730.

Chambers, Brian, to Thomas Walker Limited. Prong-attached garment fasteners devices with backing members. 3,971,106, Cl. 24-227.000.

Chambers, George S.; and Lane, Lawrence J., to General Electric Company. Generator control system. 3,971,978, Cl. 322-68.000.

Champion International Corporation: *See*—
Koenig, Raymond C., 3,971,612.

Chappelle, Emmett W.: *See*—
Picciolo, Grace L.; and Chappelle, Emmett W., 3,971,703.

Chatterjee, Pronoy Kumar, to Personal Products Company. Absorbent hydrophilic cellulosic product. 3,971,379, Cl. 128-285.000.

Cheng, King Y.: *See*—
Motley, David M.; and Cheng, King Y., 3,971,996.

Cherenko, Joseph: *See*—
Beestrice, William R.; Cherenko, Joseph; and Frey, William I., 3,971,864.

Chevron Research Company: *See*—
Schinski, William L., 3,971,650.

Chiba, Michiaki: *See*—
Takinami, Koichi; Tanaka, Takashi; Chiba, Michiaki; and Hirose, Yoshio, 3,971,701.

Chibata, Ichiro; Miyoshi, Munetugu; Ito, Hiroshi; Fujii, Toshiyuki; and Kawashima, Keisuke, to Tanabe Seiyaku Co., Ltd. Aspartyl amide sweetening agents. 3,971,822, Cl. 260-468.00R.

Chicago Lock Co.: *See*—
Mikos, Aloysius J., 3,971,242.

Chicklis, E. P.: *See*—
Naiman, Charles S.; Chicklis, E. P.; and Linz, Arthur, 3,972,007.

Childs, George William, deceased: *See*—
O'Neal, Cothburn M.; Mayo, Alfred M.; and Childs, George William, deceased, 3,971,914.

Childs, Patricia M., executrix: *See*—
O'Neal, Cothburn M.; Mayo, Alfred M.; and Childs, George William, deceased, 3,971,914.

Chimura, Keizo: *See*—
Komatsu, Toshiyoshi; and Chimura, Keizo, 3,971,093.

Ching, Yau Chau; and Chow, Ming-Chwan, to Bell Telephone Laboratories, Incorporated. Synchronization system for variable length encoded signals. 3,971,888, Cl. 178-69.5TV.

Chow, Ming-Chwan: *See*—
Ching, Yau Chau; and Chow, Ming-Chwan, 3,971,888.

Chow, Sen-Te, to United States of America, Army. Method of controlling a reference temperature to restore DC level for a thermal imaging system. 3,971,886, Cl. 178-7.100.

Christensen, Arne Orskov. Unit for ascertaining the presence of water in lubricating oil. 3,971,248, Cl. 73-61.10R.

Christensen, Ralph W.; Smith, Everett C.; and Tibol, George, to Semi-Elements, Inc.; and Solitron Devices, Inc., part interest to each. Semiconductor device material. 3,971,870, Cl. 428-336.000.

Cianciosi, Mario N.: *See—*
Bodner, Ronald E.; Cianciosi, Mario N.; Crooks, Thomas L.; Magrisso, Israel B.; Slack, Keith K.; and Smith, Richard S., 3,972,023.

Ciba-Geigy AG: *See—*
Angliker, Hans-Joerg; and Peter, Richard, 3,971,771.
Desai, Nalin Binduprasad; Jayaraman, Ponnusami; Ramanathan, Visvanathan; Artz, Klaus; Naik, Navnitrai Nagarji; and Jenny, Walter, 3,971,740.
Fasciati, Alfred; and Back, Gerhard, 3,971,738.
Zondler, Helmut; and Pfleiderer, Wolfgang, 3,971,792.

Ciba-Geigy Corporation: *See—*
Albrecht-Buehler, Gunter, 3,971,621.
Cook, Barry, 3,971,795.
Gaetzi, Karl; and Fischer, Hanspeter, 3,971,647.
Green, George Edward; and Stark, Bernard Peter, 3,971,765.
Jung, Hans Wolf; Maul, Rudolf; Kintopf, Siegfried; Kloss, Wilfried; and Knapp, Reinhard, 3,971,817.
McCrae, James McGeachie; and Midcalf, Christopher, 3,971,739.
Model, Ernst, 3,971,805.
Porret, Daniel; Habermeier, Jurgen; and Baumann, Dieter, 3,971,813.
Rasberger, Michael, 3,971,757.
Rosenberger, Siegfried; and Schwarzenbach, Kurt, 3,971,803.

Cimarusti, Christopher M.; Levine, Seymour D.; and Weisenborn, Frank L., to E. R. Squibb & Sons, Inc. Steroidal[16α,17-b]1,4-dioxanes and Steroidal[16α,17-b]1,4-dioxins. 3,971,772, Cl. 260-239.55R.

Cimarusti, Christopher M.; Weisenborn, Frank L.; and Levine, Seymour D., to E. R. Squibb & Sons, Inc. Steroidal 9,11-dihalo-[16α,17-b]1,4-dioxanes. 3,971,773, Cl. 260-239.55R.

Cimarusti, Christopher M.; Wojtkowski, Paul; and Dolfini, Joseph E., to E. R. Squibb & Sons, Inc. Thio-β-lactam penicillins. 3,971,776, Cl. 260-239.100.

Cimarusti, Christopher M.; Wojtkowski, Paul; and Dolfini, Joseph E., to E. R. Squibb & Sons, Inc. Thio-β-lactam cephalosporins. 3,971,780, Cl. 260-243.00C.

Cincinnati Electronics Corporation: *See—*
Schmit, David E.; and Wedig, Frank L., Jr., 3,971,921.

Cislaghi, Ezio; Gentili, Claudio; and Maccario, Ermanno, to Honeywell Information Systems Italia. Parity check system in a semiconductor memory. 3,972,033, Cl. 340-173.00R.

Citizen Watch Co., Ltd.: *See—*
Murakami, Tomomi; Nagata, Hiromichi; Funazawa, Masakazu; and Fukutome, Satoru, 3,971,207.
Nomura, Yasushi; and Morokawa, Shigeru, 3,971,205.

Clampitt, Richard L.: *See—*
Hessert, James E.; and Clampitt, Richard L., 3,971,440.

Clark Equipment Company: *See—*
Patton, Jon Richard; and Sisson, Ronald Loren, 3,971,453.

Clark, Gaylord J. Cylindrical brush with stub shaft support. 3,971,097, Cl. 15-179.000.

Clay, Robert B.; and Udy, Lex L. Apparatus for dewatering boreholes. 3,971,437, Cl. 166-187.000.

Clement, John B., to Recor, Inc. Method and apparatus for sorting and classifying metallic cans. 3,971,474, Cl. 209-73.000.

Clements, Lloyd W., to Ireco Industries, Inc. Trail line moves. 3,971,573, Cl. 285-5.000.

Clifford, Douglas M.: *See—*
Wenninger, Freddie W.; Morris, Donald E.; Kohoutek, Jindrich; Maitland, David S.; Clifford, Douglas M.; Schulte, Louis T.; and Keith, John C., 3,971,925.

Coatta, Joseph; and Emery, Charles Leslie. Photoelastic load measurement alarm device. 3,971,934, Cl. 250-225.000.

Coburn Optical Industries, Inc.: *See—*
Coburn, Orin W.; and Stith, Joe D., 3,971,170.

Coburn, Orin W.; and Stith, Joe D., to Coburn Optical Industries, Inc. Vaccum chuck with sealable cavity. 3,971,170, Cl. 51-284.000.

Cochran, C. Norman, to Aluminum Company of America. Carbothermic production of aluminum. 3,971,653, Cl. 75-10.00R.

Coe, Richard H.: *See—*
Martin, James M., Jr.; Heaton, Roy C.; and Coe, Richard H., 3,971,434.

Cohen, Noal, to Hoffmann-La Roche Inc. 3a,4,7,7a-Tetrahydro-4-phenylethyl-7a-alkyl-5(6H)-indanones and process for the preparation thereof. 3,971,809, Cl. 260-345.900.

Coldewey, Heiko; Ammazzalorso, Mario; and Kaps, Karl-Heinz, to Justin Huppe, Firma. Venetian blind profiled slats. 3,971,427, Cl. 160-166.00R.

Colgate-Palmolive Company: *See—*
Douglass, Miriam Lois, 3,971,725.
Smith, Frank R., Jr.; Kenney, Edward J.; and DiSalvo, Walter A., 3,971,726.

Collier, Peter Dudley; Penman, Alistair; and Trussell, Frederick John, to Thomas J. Lipton, Inc. Extracting tea using an aqueous solution of ammonium bicarbonate or ammonia. 3,971,858, Cl. 426-597.000.

Collin, Heinrich: *See—*
Nudinger, Gunter; Collin, Heinrich; and Moosburger, Hans, 3,971,524.

Combustion Engineering, Inc.: *See—*
Andrea, Christo, 3,971,482.
Lesham, Adam; and Schukei, Glen Elwin, 3,971,575.

Commissariat a l'Energie Atomique: *See—*
Duperray, Gerard; Eyraud, Charles; Lecayon, Gerard; and Lenoir, Janine, 3,971,671.
Libs, Gerard, 3,972,004.
Porte, Robert; and Rommens, Michel, 3,971,593.

Communications Satellite Corporation (Comsat): *See—*
Heiges, Melvi"e Lynwood, Jr.; Golding, Leonard; and Banyasz, Bela, 3,972,065.

Compagnie Generale d'Electricite: *See—*
Duchet, Michel, 3,972,009.

Compagnie Generale des Etablissements Michelin: *See—*
Boileau, Jacques, 3,971,424.

Compagnie Honeywell Bull (Societe Anonyme): *See—*
Deproux, Jacques Roland, 3,971,311.

Conger, Robert R., to Zenith Radio Corporation. Color cathode ray tube with improved faceplate-funnel referencing structures. 3,971,490, Cl. 220-2.10A.

Conibear, Frank R. Actuator for animal trap. 3,971,155, Cl. 43-90.000.

Conroy, William E.; Ehlke, Charles C.; and Sidles, Peter, Jr., to Caterpillar Tractor Co. Axially compact clutch and brake mechanism. 3,971,461, Cl. 192-18.00A.

Consolidated Foods Corporation: *See—*
Crowder, John V., 3,971,853.

Constant, James N. High capacity recirculating delay loop integrator. 3,971,993, Cl. 328-127.000.

Container Corporation of America: *See—*
Allan, Roger J.; and Hart, Joseph J., 3,971,503.
Helms, Charles R.; and Patrick, William D., 3,971,468.

Continental Can Company, Inc.: *See—*
Friendship, Kenneth F. M., 3,971,173.
McNeill, Frank M.; and Martinek, Harold H., 3,971,187.

Cook, Barry, to Ciba-Geigy Corporation. Piperidine derivatives. 3,971,795, Cl. 260-293.880.

Cook, Martin Christopher; Gregory, Gordon Ian; and Bradshaw, Janice, to Glaxo Laboratories Limited. Cephalosporins having (α-etherified oximino)acylamido groups at the 7-position. 3,971,778, Cl. 260-243.00C.

Cooke, William Ernest, to Alcan Research and Development Limited. Method of brazing aluminum. 3,971,501, Cl. 228-248.000.

Corbett, Joseph H., to Sherwood Medical Industries Inc. Medical tube with cuff. 3,971,385, Cl. 128-351.000.

Cord Systems, Inc.: *See—*
Wiese, Frank D.; Link, Donald F.; and Brown, Charles W., 3,971,306.

Cornell, Gerald J.: *See—*
Dohanic, John L., Jr.; and Cornell, Gerald J., 3,972,017.

Cornil, Jean-Philippe, to Gaz de France. Arrangements for preventing or minimizing over-pressures in gas pipes. 3,971,399, Cl. 137-119.000.

Cortner, William C., Jr., to Dale Alley Co. Livestock dusting bag. 3,971,342, Cl. 119-159.000.

Cosmo, Nicola, to Ing. C. Olivetti & C., S.p.A. Automatic sheet changing system for reprographic machines. 3,971,553, Cl. 271-3.000.

Cottin, Jean-Pierre: *See—*
Boel, Charles; Cottin, Jean-Pierre; and Guitard, Francois, 3,971,175.

Couchman, Robert, Jr.: *See—*
Harkness, Joseph R.; and Couchman, Robert, Jr., 3,971,353.

Coueille, Daniel, to Saft-Societe des Accumulateurs Fixes et de Traction. Electrochemical cell with fluid-tight casing and method of construction. 3,971,673, Cl. 136-133.000.

Coussot, Gerard; and Menager, Olivier, to Thomson-CSF. Surface elastic wave electromechanical device. 3,972,011, Cl. 333-30.00R.

Cowdery, David J., to Telectronics Pty. Limited. Titanium covered cardiac pacemaker with elastomer coating and method of applying same. 3,971,388, Cl. 128-419.00P.

Cowley, Brian Richard; and Martin, David George, to Glaxo Laboratories Limited. Process for preparing penicillin antibiotics. 3,971,775, Cl. 260-239.100.

Cox, David Alexander: *See—*
Barnish, Ian Thompson; Cox, David Alexander; and Evans, Anthony Garth, 3,971,783.

Crafford, Joseph C.; Dowling, Vincent J., Jr.; and Gusack, James A., to Dow Badische Company. Wear testing device. 3,971,245, Cl. 73-7.000.

Craig, Henry A. Trolling planer. 3,971,154, Cl. 43-43.130.

Craig, James R.; and Otto, George W., Jr., to American Radiologic Systems Inc. X-ray apparatus with improved housing for components. 3,971,946, Cl. 250-422.000.

Crane Packing Company: *See—*
Inka, Egons, 3,971,280.

Critchett, Paul J. Multipurpose table. 3,971,327, Cl. 108-60.000.

Crompton & Knowles Corporation: *See—*
Feeman, James F., 3,971,769.

Crooks, Thomas L.: *See—*
Bodner, Ronald E.; Cianciosi, Mario N.; Crooks, Thomas L.; Magrisso, Israel B.; Slack, Keith K.; and Smith, Richard S., 3,972,023.

Crosby, Lawton H.; and Keane, Thomas H., to Morley Furniture Spring Corporation. Spring attachment assemblies. 3,971,082, Cl. 5-260.000.

Crotti, Renato. Apparatus for collecting a coreless coiled thread package. 3,971,521, Cl. 242-47.000.

Crover, Stephen Earl; and Brown, Gordon Eugene, to Stanley Works, The. Breaker construction and valve therefor. 3,971,448, Cl. 173-134.000.

Crowder, John V., to Consolidated Foods Corporation. Frozen confection and method and apparatus for making same. 3,971,853, Cl. 426-249.000.

Crowe, Talmadge L., to Baker Oil Tools, Inc. Wireline safety valve with split ball. 3,971,438, Cl. 166-224.00A.

Csathy, Denis G., to Deltak Corporation. Coal fired package boiler. 3,971,345, Cl. 122-510.000.

Culler, Virgil H.: *See—*
United States of America, National Aeronautics and Space Administration; Feldstein, Cyril; Lewis, Gilbert W.; Silver, Robert H.; and Culler, Virgil H., 3,971,363.
United States of America, National Aeronautics and Space Administration; Feldstein, Cyril; Lewis, Gilbert W.; Silver, Robert H.; and Culler, Virgil H., 3,971,364.

Curtin, Hoyt S. Pipe coupling. 3,971,574, Cl. 285-31.000.

Curtis, Daniel L.; and Le Vantine, Allan D. Fingerprint inking device. 3,971,335, Cl. 118-6.000.

Curtis, William R.; and Trimble, David C., to Hercules Incorporated. U-shaped furniture frame. 3,971,587, Cl. 297-452.000.

Cutler-Hammer, Inc.: *See—*
Piber, Earl T., 3,971,908.

Cvitkovich, Mary, to Lawrence Peska Associates, Inc., a part interest. Dual compartment beverage urn. 3,971,304, Cl. 99-291.000.

D. H. Baldwin Company: *See—*
Lampkin, Curtis M., 3,971,672.
Wayne, William C., Jr., 3,971,283.

Daftary, Rasik D., to Archer Daniels Midland Company. Process for preparing soy protein concentrate. 3,971,856, Cl. 426-417.000.

Daguet, Jacques Lucien: *See—*
Bellanger, Maurice Georges; and Daguet, Jacques Lucien, 3,971,922.

Dahl, Myrland J., to Malt-o-Meal Company. Apparatus for continuous puffing. 3,971,303, Cl. 99-323.400.

Dalamangas, Chris A.: *See—*
Buchoff, Leonard S.; Kosiarski, Joseph P.; and Dalamangas, Chris A., 3,971,610.

Dale Alley Co.: *See—*
Cortner, William C., Jr., 3,971,342.

Damani, Nalinkant C., to Alza Corporation. Medicament dispensing process for inhalation therapy. 3,971,377, Cl. 128-266.000.

Damratowski, Harold E., to Triad Fastener Corporation. Air-powered, self-feeding screw driving tool. 3,971,421, Cl. 144-32.000.

Daniel, Daniel S.: *See—*
Herz, Arthur H.; and Daniel, Daniel S., 3,971,662.

Dann, Fred M.; and Reigel, James. Projection forming of three-dimensional metal objects. 3,971,911, Cl. 219-162.000.

Darling, Phillip H. Rotary knitting machine. 3,971,232, Cl. 66-1.00R.

Dart Industries Inc.: *See—*
Spoeth, Carl R., Jr., 3,971,360.

Daswick, Alexander C. Disposable beverage brewer. 3,971,305, Cl. 99-295.000.

Daver, Edul M., to Alcan Aluminum Corporation. Sintering of particulate metal. 3,971,657, Cl. 75-211.000.

Davila, Jose E.: *See—*
Mojden, Wallace W.; Davila, Jose E.; Hooper, George W.; Kwiatkowski, Gerald M.; and Pantel, Howard W., Jr., 3,971,189.

Davis, Donald E. Gutter cleaning nozzle. 3,971,098, Cl. 15-410.000.

Davis, Gerald G.; and Keough, Joan M., to SCM Corporation. Electrocoating process. 3,971,708, Cl. 204-181.000.

Davis, Orin H. Pneumatic courier dispatch unit. 3,971,531, Cl. 243-25.000.

Davis, Ross Alan. FM-AM windshield antenna. 3,972,048, Cl. 343-712.000.

Davy Powergas Inc.: *See—*
Schneider, Raymond T., 3,971,844.

Deal, Troy M. Dredge cutter head. 3,971,148, Cl. 37-66.000.

de Chair, Rory Somerset. Gas generators. 3,971,209, Cl. 60-39.140.

Deering Milliken Research Corporation: *See—*
Frentress, Zane, 3,972,069.

Dehmel, Georg; and Blahak, Johannes, to Bayer Aktiengesellschaft. Water-insoluble polyazo dyestuff comprising two or three identical azo dyestuffs joined to a central nucleus by carboxyl bridges. 3,971,741, Cl. 260-173.000.

Delaage, Jacques, to Societe d'Etudes et de Construction de Materiel Electronique - S.E.C.M.E. Switch for a printed or like circuit. 3,971,905, Cl. 200-77.000.

Delalande S.A.: *See—*
Fauran, Claude P.; Eberle, Jeannine A.; Bourgery, Guy R.; Raynaud, Guy M.; and Pourrias, Bernard M., 3,971,793.

DeLaval Turbine Inc.: *See—*
Toth, Michael, Jr.; and Jackson, Jean Andre, Jr., 3,971,218.

Delorey, David R.: *See—*
Tardiff, Armand L.; Broughton, Glover F.; Delorey, David R.; and Pearson, Bangt R., 3,971,193.

Deltak Corporation: *See—*
Csathy, Denis G., 3,971,345.

Demag Aktiengesellschaft: *See—*
Becker, Klaus; and Sprung, Hartwig, 3,971,459.

Demler, Henry William, Jr.: *See—*
Wulf, LaVern Dale; and Demler, Henry William, Jr., 3,971,902.

Demuth, John W.: *See—*
Newman, Larry B.; and Demuth, John W., 3,971,518.

Denenberg, Jeffrey Neil, to Bell Telephone Laboratories, Incorporated. AM/FM receiver using spectral parameter estimators. 3,971,988, Cl. 325-316.000.

Dentsply Research & Development Corporation: *See—*
Leu, Robert F., 3,971,135.

Denzel, Theodor; and Hoehn, Hans, to E. R. Squibb & Sons, Inc. Derivatives of 1H-triazolo[4,5-c]pyridine-7-carboxylic acids and esters. 3,971,800, Cl. 260-295.50B.

Denzel, Theodor; and Hoehn, Hans, to E. R. Squibb & Sons, Inc. Derivatives of 1H-triazolo[4,5-c]pyridine-7-carboxylic acids and esters. 3,971,801, Cl. 260-295.50B.

DePenti, Kenneth L., to Midland-Ross Corporation. Railway car coupler. 3,971,479, Cl. 213-127.000.

Deproux, Jacques Roland, to Compagnie Honeywell Bull (Societe Anonyme). Striking device for dot printer. 3,971,311, Cl. 101-93.040.

Derickson, Richard B., III; and Rallapalli, Krishna, to Fairchild Camera and Instrument Corporation. Universal first-in first-out memory device. 3,972,034, Cl. 340-173.00R.

Derry, Juanita. Refrigerator with dry ice coolant. 3,971,231, Cl. 62-388.000.

Desai, Nalin Binduprasad; Jayaraman, Ponnusami; Ramanathan, Visvanathan; Artz, Klaus; Naik, Navnitrai Nagarji; and Jenny, Walter, to Ciba-Geigy AG. Monoazo compounds. 3,971,740, Cl. 260-158.000.

Desblache, Andre Eugene; Stern, Thomas Edwin; and Thirion, Philippe Emmanuel, to International Business Machines Corporation. Phase filter for reducing the effects of the noise components altering discrete phase modulated signals. 3,972,000, Cl. 329-105.000.

Deshpande, Arun K., to Erco Industries Limited. Oxidation of phosphorus in aqueous medium. 3,971,707, Cl. 204-149.000.

Desimone, David Anthony: *See—*
Fenkel, Stanley O., 3,971,572.

Detert, Klaus; and Lipp, Hans-Jochen, to Licentia Patent-Verwaltungs-G.m.b.H. Magnetic material of high strength and toughness. 3,971,676, Cl. 148-121.000.

Detraz, Jacques; and Gambut, Michel, to La Technique Integrale S.A. Screw-and-nut mechanism with ball or roller recirculation. 3,971,264, Cl. 74-459.000.

Deutsche Angelgerate Manufaktur (DAM) Hellmuth Kuntze Gesellschaft mit beschrankter Haftung K.G.: *See—*
Dorbandt, Klaus, 3,971,529.

Deutsche Babcock & Wilcox Aktiengesellschaft: *See—*
Ulrich, Erich; and van Liempt, Adrianus Reinier, 3,971,343.

Devrick, Charles E.; Houmis, Nicholas J.; and Johnson, Russell A., to Fibreboard Corporation. Apparatus for cutting a member and seal means for association with such member. 3,971,294, Cl. 90-20.000.

de Waltoff, Lionel, to Handy Chemicals Limited. Alloy plating system. 3,971,861, Cl. 427-247.000.

Dewrance & Company, Limited: *See—*
Wierzbicki, Alexander, 3,971,412.

Diamond International Corporation: *See—*
Peppler, William S., 3,971,689.

Dietrich, Georg: *See—*
Menrad, Berthold; Ripper, Karl; Ilg, Rudolf; and Dietrich, Georg, 3,971,632.

Diforte, Mariano P., Jr., to Bat Weight, Inc. Weighting device for attachment to baseball bats. 3,971,559, Cl. 273-26.00R.

DiSalvo, Walter A.: *See—*
Smith, Frank R., Jr.; Kenney, Edward J.; and DiSalvo, Walter A., 3,971,726.

DiStefano, Thomas Herman, to International Business Machines Corporation. Dielectric diode, fabrication thereof, and charge store memory therewith. 3,972,059, Cl. 357-6.000.

Diveley, William R., to Hercules Incorporated. Metal salts of 1,1,5,5-tetrasubstituted dithiobiurets and their use as population control agents. 3,971,781, Cl. 260-246.00B.

Dohanic, John L., Jr.; and Cornell, Gerald J., to Louis Marx & Co., Inc. DC potential controller. 3,972,017, Cl. 338-165.000.

Doi, Masayuki: *See—*
Inakura, Tuneho; and Doi, Masayuki, 3,971,266.

Dolby, Ray Milton. Compressors, expanders and noise reduction systems. 3,972,010, Cl. 333-14.000.

Dolfini, Joseph E.: *See—*
Cimarusti, Christopher M.; Wojtkowski, Paul; and Dolfini, Joseph E., 3,971,776.
Cimarusti, Christopher M.; Wojtkowski, Paul; and Dolfini, Joseph E., 3,971,780.

Domaracki, John F.: *See—*
Hedgewick, Peter; Suhr, Donald C.; Domaracki, John F.; and Arnott, Robin A., 3,971,623.

Domokos, Alex: *See—*
Kleinberg, Israel; Domokos, Alex; and Castaldi, Cosmo, 3,971,954.

Don, Jules M.: *See—*
Boyajian, Alfred Z.; and Don, Jules M., 3,971,131.

Donahue, Charles R.; and Williams, Philip J., to GF Business Equipment, Inc. Portable wall assembly. 3,971,182, Cl. 52-282.000.

Dorbandt, Klaus, to Deutsche Angelgerate Manufaktur (DAM) Hellmuth Kuntze Gesellschaft mit beschrankter Haftung K.G. Fishing reel. 3,971,529, Cl. 242-211.000.

Dorn, Conrad P.: *See—*
Shen, Tsung-Ying; Jones, Howard; Mulvey, Dennis M.; and Dorn, Conrad P., 3,971,797.

Douglas, Larry J., to Marathon Oil Company. Designing micellar displacement systems to minimize adsorption. 3,971,439, Cl. 166-252.000.

Douglass, Miriam Lois, to Colgate-Palmolive Company. 2-Mercaptoquinoxaline-1-oxides, salts thereof and 2-(1-oxoquinoxalinyl)disulfides in detergent compositions. 3,971,725, Cl. 252-106.000.

Dow Badische Company: *See—*
Crafford, Joseph C.; Dowling, Vincent J., Jr.; and Gusack, James A., 3,971,245.
Dow Chemical Company, The: *See—*
Kochanny, Gerald L., Jr.; and Chamberlin, Thomas A., 3,971,730.
McGregor, Stanley D., 3,971,799.
Rains, William A.; Fox, Robert D.; and Flynn, James P., 3,971,681.
Skelcey, James S., 3,971,846.
Thomas, Robert C., 3,971,675.
Dow Corning Corporation: *See—*
Bank, Howard M.; and Michael, Keith W., 3,971,747.
Lee, Chi-Long; and Marko, Ollie W., 3,971,818.
Trombley, Wayne E.; and Jacobson, Lawrence R., 3,971,163.
Dowling, Vincent J., Jr.: *See—*
Crafford, Joseph C.; Dowling, Vincent J., Jr.; and Gusack, James A., 3,971,245.
Dresser Industries, Inc.: *See—*
Rose, Willis Earl, 3,971,210.
Droney, Patrick J.: *See—*
Messina, Thomas A.; and Droney, Patrick J., 3,971,785.
Drzewiecki, Tadeusz M., to United States of America, Army. Laminar jet linear accelerometer. 3,971,257, Cl. 73-515.000.
Duchateau, Georges Francois Michel Frederic: *See—*
Blaude, Joseph Emile Albert; and Duchateau, Georges Francois Michel Frederic, 3,971,667.
Duchenne, Henri, to Regie Nationale des Usines Renault. Apparatus for molding cast iron parts containing spheroidal graphite. 3,971,433, Cl. 164-362.000.
Duchet, Michel, to Compagnie Generale d'Electricite. Electron beam generator and gas laser head in combination therewith. 3,972,009, Cl. 331-94.5PE.
Dudley, George M. Machine tool having internally routed cryogenic fluid for cooling interface between cutting edge of tool and workpiece. 3,971,114, Cl. 29-106.000.
Duncan, Alexander William, to GTE Sylvania Incorporated. Automatic load compensating clamp truck jaws. 3,971,584, Cl. 294-88.000.
Duncan, David Robertson. Spraying apparatus. 3,971,512, Cl. 239-1.000.
Dunkelberger, David L.: *See—*
Myers, Robert M.; Dunkelberger, David L.; and Carty, Daniel T., 3,971,835.
Dunkle, Robert P.: *See—*
Burger, John H.; McClelland, John R.; and Dunkle, Robert P., 3,971,679.
Duperray, Gerard; Eyraud, Charles; Lecayon, Gerard; and Lenoir, Janine, to Commissariat a l'Energie Atomique. Radioelectrochemical energy converter. 3,971,671, Cl. 136-86.00R.
Du Pont de Nemours, E. I., and Company: *See—*
Gorrafa, Adly Abdel-Moniem, 3,971,108.
Setterquist, Robert Alton, 3,971,767.
Taylor, Harold J., 3,971,234.
Windley, William Thomas, 3,971,202.
Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, to Smith Kline & French Laboratories Limited. Pyridyl alkylguanidine compounds, composition therewith, and methods of inhibiting H-2 histamine receptors. 3,971,786, Cl. 424-263.000.
Durrer, Hermann A., to Sulzer Brothers Limited. Chimney for exhaust gas having an adjustable means for throttling a flow of exhaust gas. 3,971,302, Cl. 98-60.000.
Duskin Franchise Co., Ltd.: *See—*
Komatsu, Toshiyoshi; and Chimura, Keizo, 3,971,093.
Dymit, Joseph M.: *See—*
Peters, Leo; Dymit, Joseph M.; Lilley, James C.; Smith, Donald R.; and Warners, Henry, 3,971,273.
Dynamit Nobel Aktiengesellschaft: *See—*
Lenz, Arnold; and Rogler, Walter, 3,971,833.
E. R. Squibb & Sons, Inc.: *See—*
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Cimarusti, Christopher M.; Weisenborn, Frank L.; and Levine, Seymour D., 3,971,773.
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Cimarusti, Christopher M.; Wojtkowski, Paul; and Dolfini, Joseph E., 3,971,780.
Denzel, Theodor; and Hoehn, Hans, 3,971,800.
Denzel, Theodor; and Hoehn, Hans, 3,971,801.
Hauck, Frederic P.; Sundeen, Joseph E.; and Reid, Joyce, 3,971,823.
Heyer, Robert E.; and Bolter, Bernard J., 3,971,955.
Eastman Kodak Company: *See—*
Herz, Arthur H.; and Daniel, Daniel S., 3,971,662.
Newman, Larry B.; and Demuth, John W., 3,971,518.
Staehle, Henry C., 3,971,660.
Van Meter, James P.; and Klanderman, Bruce H., 3,971,824.
Zannucci, Joseph Salvatore; and Lappin, Gerald Ray, 3,971,755.
Eberle, Jeannine A.: *See—*
Fauran, Claude P.; Eberle, Jeannine A.; Bourgery, Guy R.; Raynaud, Guy M.; and Pourrias, Bernard M., 3,971,793.
Economy, James; Lin, Ruey Y.; and Smith, William D., to Carborundum Company, The. Production of high strength carbide fibers by heat treatment. 3,971,840, Cl. 264-231.000.
Edling, Porter R.; Yoast, Kenneth L.; and Wickline, Glenn D., deceased (by Wickline, Mrs. Glenn D., executrix), to Offshore Company, The. Emergency mooring release. 3,971,328, Cl. 114-221.00R.
Ehlke, Charles C.: *See—*
Conroy, William E.; Ehlke, Charles C.; and Sidles, Peter, Jr., 3,971,461.
Eikelberger, Rand Jeffrey, to Illinois Tool Works Inc. Wheel velocity sensor with exciter ring runout compensation. 3,971,995, Cl. 328-149.000.
Eilo, Clyde W.: *See—*
Burkle, William C.; and Eilo, Clyde W., 3,971,318.
Elast-O-Cor Products & Engineering Limited: *See—*
Reid, Charles M, 3,971,718.
Electronic Memories and Magnetics Corporation: *See—*
Havelka, Steven E.; Graham, Paul L.; and Matschke, Carl L., 3,971,186.
Elkuch, Erwin. Method for erecting a pile wall adapted to take compressive forces and a pile wall produced by the method. 3,971,224, Cl. 61-41.00A.
Ellender, Robert D., Jr. Process for removing sulfur from crude oil. 3,971,713, Cl. 208-226.000.
Ellis, Paul H.; and Kramer, Richard R., to United States of America, Army. Adjustable muzzle compensator. 3,971,285, Cl. 89-14.00C.
Elrod, Donald L. Rectractable automobile trunk lid tie down. 3,971,589, Cl. 296-76.000.
Emery, Charles Leslie: *See—*
Coatta, Joseph; and Emery, Charles Leslie, 3,971,934.
Emmett, John Colin: *See—*
Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, 3,971,786.
Endo, Yuzo, to Kimura, Shoichi; and Mitsui Construction Co., Ltd. Earth anchor work method and anchor device. 3,971,177, Cl. 52-166.000.
Engineering Enterprises, Inc.: *See—*
Fox, Fred K., 3,971,450.
England, Richard E.: *See—*
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Enos, Herman Isaac, Jr.: *See—*
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van Gerven, Johannes T. M., 3,971,383.
Erco Industries Limited: *See—*
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Erdell, John Buckland. Safelight filter. 3,971,929, Cl. 240-10.60R.
Erickson, David J., to Sparton Corporation. Electromechanical transducer. 3,972,018, Cl. 340-10.000.
Ernst, Franklin Henry, Jr.; and Nelson, Martin N. Tri-level selector. 3,971,473, Cl. 209-73.000.
Ernst Winter & Sohn: *See—*
Sawluk, Wlodzimierz, 3,971,358.
Essad, Robert A.: *See—*
Jeunehomme, Michel L.; and Essad, Robert A., 3,971,943.
Esterline Corporation: *See—*
Mayfield, Glenn A., 3,971,979.
Etat Francais: *See—*
Gay-Chatain, Guillaume Antonin; and Montjallard, Paul Rene Marius, 3,971,460.
Ethyl Corporation: *See—*
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Robinson, Gene C., 3,971,728.
Evans, Anthony Garth: *See—*
Barnish, Ian Thompson; Cox, David Alexander; and Evans, Anthony Garth, 3,971,783.
Evans, David T.; Proctor, Ellen M.; Brion, Frank R.; and Ceelen, Theodorus M., to Xerox Corporation. Independent compression and positioning device for use in mammography. 3,971,950, Cl. 250-451.000.
Evans, Lyle B. Vehicle conveyor. 3,971,325, Cl. 104-172.00B.
Everett, George, to Gros-ite Industries, Inc. Telescope assemblies. 3,971,620, Cl. 350-26.000.
Everett, Harry F.: *See—*
Taylor, Duane F.; Everett, Richard C.; Everett, Harry F.; and Williams, Norman C., 3,971,398.
Everett, Richard C.: *See—*
Taylor, Duane F.; Everett, Richard C.; Everett, Harry F.; and Williams, Norman C., 3,971,398.
Ewbank, John R., to Atlantic Richfield Company. Continuous displacement chromatographic separation. 3,971,842, Cl. 423-7.000.
Extrados Company Limited: *See—*
Svirklys, Ferdinand M., 3,971,326.
Exxon Production Research Company: *See—*
Peters, Beldon A., 3,971,719.
Eyraud, Charles: *See—*
Duperray, Gerard; Eyraud, Charles; Lecayon, Gerard; and Lenoir, Janine, 3,971,671.
F. Kuppersbusch & Sohne Aktiengesellschaft: *See—*
Lohr, Alfred; Schwan, Wolfgang; Tschek, Wolfgang; and Schreiber, Gunter, 3,971,420.
Factory Mutual Research Corporation: *See—*
Zenker, Karol R., 3,971,443.
Fairchild Camera and Instrument Corporation: *See—*
Derickson, Richard B., III; and Rallapalli, Krishna, 3,972,034.
Fantozzi, Louis J., to Xerox Corporation. Programmable billing system. 3,971,919, Cl. 235-92.0SB.

Farley, Brent. Chair for aiding conjugal relations for the infirm. 3,971,592, Cl. 297-217.000.

Fasano, Ernest L. Display device background component composition and method. 3,971,724, Cl. 252-63.200.

Fasciati, Alfred; and Back, Gerhard, to Ciba-Geigy AG. Heavy metal complexes of azo compounds containing a halogeno-2,3-dihydroxy pyridine coupling component. 3,971,738, Cl. 260-146.00R.

Fauran, Claude P.; Eberle, Jeannine A.; Bourgery, Guy R.; Raynaud, Guy M.; and Pourrias, Bernard M., to Delalande S.A. Certain 6-(dialkylamino, pyrrolidino and piperidino)ethoxy-4,7-dimethoxy-5-(3-phenyl-1-hydroxypropyl)2,3-dihydrobenzofurans. 3,971,793, Cl. 260-293.580.

Faust, Carl Walter; and Smith, Arnold Ray, to Bell Telephone Laboratories, Incorporated. Cable splice closure. 3,971,894, Cl. 174-41.000.

Federhen, Herbert M.: *See—*
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Feeman, James F., to Crompton & Knowles Corporation. Sulfoalkyl aminophenyl disazo dyes. 3,971,769, Cl. 260-186.000.

Feeney, Thomas Aquinas: *See—*
Varney, Justin Arnold; and Feeney, Thomas Aquinas, 3,971,255.

Feinberg, Isadore: *See—*
Bertolini, William A.; and Feinberg, Isadore, 3,971,122.

Feine, Wolfgang: *See—*
Solf, Johannes; and Feine, Wolfgang, 3,971,094.

Feit, Peter Werner, to Lovens Kemiske Fabrik Produktionsaktieselskab. 3-Amino, 4-thio-substituted, 5-sulphamyl-benzoic acid derivatives. 3,971,819, Cl. 260-465.00D.

Feldstein, Cyril: *See—*
United States of America, National Aeronautics and Space Administration; Feldstein, Cyril; Lewis, Gilbert W.; Silver, Robert H.; and Culler, Virgil H., 3,971,363.
United States of America, National Aeronautics and Space Administration; Feldstein, Cyril; Lewis, Gilbert W.; Silver, Robert H.; and Culler, Virgil H., 3,971,364.

Felix, Ernst; and Locher, Hans, to Zellweger, Ltd. Regulation of electronically operated quality control equipment. 3,971,272, Cl. 83-13.000.

Fenkel, Stanley O., to Desimone, David Anthony, a part interest. Magazine cover. 3,971,572, Cl. 281-46.000.

Fernandez, Pablo Martinez, to Francisco Martin Martin. System for millesimal measure. 3,971,137, Cl. 33-164.00R.

Ferranti, Limited: *See—*
Shepherd, Geoffrey, 3,971,994.

Ferro Corporation: *See—*
Ruderer, Clifford G., 3,971,120.

Fibreboard Corporation: *See—*
Devrick, Charles E.; Houmis, Nicholas J.; and Johnson, Russell A., 3,971,294.

Figueroa, Raymond Oscar: *See—*
Bilsens, Gunars; and Figueroa, Raymond Oscar, 3,971,999.

Filton Limited: *See—*
Walker, Gordon Richard, 3,971,119.

Finck, Edward J.: *See—*
Taylor, Franklyn H.; and Finck, Edward J., 3,971,219.

Finn, Lawrence R.: *See—*
Kowalski, Carl D.; Finn, Lawrence R.; and Yawberg, Richard C., 3,971,277.

Firth, Donald; Foster, Keith; and Hooke, Christopher John, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Trade and Industry in Her Britannic Majesty's Government of the. Reciprocatable devices. 3,971,217, Cl. 60-486.000.

Fischer, Hanspeter: *See—*
Gaetzi, Karl; and Fischer, Hanspeter, 3,971,647.

Fish, Paul R., Sr. Remotely controlled collapsible dust pan. 3,971,095, Cl. 15-257.700.

Fishing Tools, Inc.: *See—*
Lee, William T., 3,971,436.

Fitzmaurice, Michael W.; and Abshire, James B., to United States of America, National Aeronautics and Space Administration. Polarization compensator for optical communications. 3,971,930, Cl. 250-199.000.

Fleetwood Systems, Inc.: *See—*
Mojden, Wallace W.; Davila, Jose E.; Hooper, George W.; Kwiatkowski, Gerald M.; and Pantel, Howard W., Jr., 3,971,189.

Fleischer, Henry. Baby holding device. 3,971,079, Cl. 5-97.000.

Fletcher, David T.: *See—*
Lenk, Ronald J.; and Fletcher, David T., 3,971,372.

Flippin, Anne: *See—*
United States of America, National Aeronautics and Space Administration; Flippin, Anne; and Schmitt, Arthur L., 3,971,915.

Flournoy, Norman Eustace, to Texaco Inc. Timing mode selector. 3,971,959, Cl. 307-225.00R.

Flynn, James P.: *See—*
Rains, William A.; Fox, Robert D.; and Flynn, James P., 3,971,681.

Focht, Claude K.: *See—*
McDuffie, James W.; Focht, Claude K.; and Rowland-Hill, Edward W., 3,971,390.

Fogarty, John E., Jr. Continuous filter. 3,971,721, Cl. 210-401.000.

Foley, James P., to Roanwell Corporation. Communications headset with rotatable and tiltable electrical connector. 3,971,900, Cl. 179-156.00A.

Foley, James P., to Roanwell Corporation. Communications headset with reversible mounting means. 3,971,901, Cl. 179-156.00A.

Foley, Kevin M.; Bell, Reuben H.; and McCombs, Frank P., to Owens-Corning Fiberglas Corporation. Fire resistant epoxy resins cured with phosphorus trihalides. 3,971,750, Cl. 260-37.0EP.

Folgero, Kare; Norberg, Lars-Gunnar; and Oberg, Karl-Erik, to Allmanna Svenska Elektriska Aktiebolaget. Metallurgical furnace having a blast injection nozzle. 3,971,548, Cl. 266-218.000.

Foller, Werner, to Gestra-KSB Vertriebsgesellschaft mbH & Co. Kommanditgesellschaft Bremen. Throttle valve. 3,971,415, Cl. 137-630.190.

Forbes, Robert Stafford; Herrick, Gary Dean; and Richter, Robert Julius, to Puritan Equipment, Inc. Combined oxygen mask and smoke goggle apparatus with automatic flush valve. 3,971,368, Cl. 128-142.00R.

Ford Motor Company: *See—*
Amato, Frank M.; and England, Richard E., 3,971,112.

Foreman, Kenneth C. Rock separator. 3,971,716, Cl. 209-396.000.

Foster, Keith: *See—*
Firth, Donald; Foster, Keith; and Hooke, Christopher John, 3,971,217.

Fountain, Craig. Rudder restraint for grounded aircraft. 3,971,532, Cl. 244-1.00R.

Fowler, John H.: *See—*
Herd, David P.; and Fowler, John H., 3,971,576.

Fowler, Stephen G. Weaving machine, apparatus and method. 3,971,418, Cl. 139-116.600.

Fox, Duke M., to Fox Manufacturing Company. Two cycle engine with peripheral bypass for piston head and method of manufacture. 3,971,297, Cl. 92-169.000.

Fox, Fred K., to Engineering Enterprises, Inc. Well drilling tool. 3,971,450, Cl. 175-107.000.

Fox Manufacturing Company: *See—*
Fox, Duke M., 3,971,297.

Fox, Robert D.: *See—*
Rains, William A.; Fox, Robert D.; and Flynn, James P., 3,971,681.

Franaszek, Peter A.: *See—*
Carrubba, Francis P.; Franaszek, Peter A.; and Grossman, David D., 3,971,987.

Francisco Martin Martin: *See—*
Fernandez, Pablo Martinez, 3,971,137.

Franke, Kurt, to Siemens Aktiengesellschaft. X-ray diagnostic apparatus for use with an X-ray photographing device providing for a preset X-ray exposure time. 3,971,945, Cl. 250-402.000.

Frantzen, John J.; and Barton, Lee C., to Buckbee-Mears Company. Etching process for accurately making small holes in thick materials. 3,971,682, Cl. 156-11.000.

Franz, John E.; and Nufer, Hans L., to Monsanto Company. Herbicidal use of carboxyalkyl ester of N-phosphonomethyl glycine. 3,971,648, Cl. 71-86.000.

Frech, Anton. Automatically actuated suspended railway cabin closures. 3,971,324, Cl. 104-28.000.

Frechtling, Arthur C.; Johnston, Norman W.; and Shaw, Richard G., to Union Carbide Corporation. Polymer composites and preparation thereof. 3,971,753, Cl. 260-42.140.

Frederick, Charles V. Wall structure. 3,971,180, Cl. 52-251.000.

Fredrikson, Bengt; and Oberg, Karl-Erik, to Allmanna Svenska Elektriska Aktiebolaget. Apparatus and method for refining metal. 3,971,547, Cl. 266-244.000.

Freeborn, Lowell C.: *See—*
Budke, Robert L.; and Freeborn, Lowell C., 3,971,113.

Freericks, Alfred H., to Addressograph Multigraph Corporation. Indicia disc. 3,972,054, Cl. 354-15.000.

French, Neil S., to Raymond Lee Organization, Inc., The, a part interest. Propulsion pump for water borne vessels. 3,971,330, Cl. 115-32.000.

Frentress, Zane, to Deering Milliken Research Corporation. Magnetic tape control system circuit for selectively blocking the effect of parity-check characters. 3,972,069, Cl. 360-48.000.

Frey, William I.: *See—*
Beestrice, William R.; Cherenko, Joseph; and Frey, William I., 3,971,864.

Frezza, Robert, to Samcoe Holding Corporation. High production steamer. 3,971,235, Cl. 68-5.00E.

Fried, Mark A.: *See—*
Gemmell, Frank S.; and Fried, Mark A., 3,971,317.

Friendship, Kenneth F. M., to Continental Can Company, Inc. Process for heat treating plastic bottles. 3,971,173, Cl. 53-29.000.

Fritz Buser AG Maschinenfabrik: *See—*
Voegelin, Heinrich, 3,971,313.

Froumajou, Armand, to Automobiles Peugeot; and Regie Nationale des Usines Renault. Fuel feed of rotary cylinder combustion engines. 3,971,349, Cl. 123-44.00D.

Fruda, Ivan; and Trumbetas, Jerome Francis, to General Foods Corporation. Multifunctional sweetening composition. 3,971,857, Cl. 426-548.000.

Fruehauf Corporation: *See—*
Abbott, Richard, 3,971,688.

Fryer, Thomas B.: *See—*
Pope, Jack M.; and Fryer, Thomas B., 3,971,362.

Fuji Photo Film Co., Ltd.: *See—*
Nakazawa, Yoshiyuki; Nakamura, Yasuharu; Sueyoshi, Tohru; and Sato, Akira, 3,971,664.

Fujii, Kiyoshi: *See—*
Hirai, Koji; Okamura, Takayuki; and Fujii, Kiyoshi, 3,971,746.

Fujii, Toshiyuki: *See—*
Chibata, Ichiro; Miyoshi, Munetugu; Ito, Hiroshi; Fujii, Toshiyuki; and Kawashima, Keisuke, 3,971,822.

Fujita, Tatsuo: *See—*
Nakano, Yoshiki; Nakamura, Heiichiro; Fujita, Tatsuo; Nakamura, Kanichi; and Higo, Masaaki, 3,971,606.

Fukayama, Gary P.; and Repay, Laszlo N., to Motorola, Inc. Mode selector lockout mechanism for a cassette tape recorder/reproducer. 3,972,070, Cl. 360-77.000.

Fukui, Takasuke: *See—*
Nakagome, Yukio; Watanabe, Teruji; Fukui, Takasuke; and Suzuki, Shizuo, 3,971,981.

Fukuoka, Yoshikazu; and Miwa, Hiroshi, to Nippon Kokan Kabushiki Kaisha. Continuous hot-dip galvanizing process for steel strip. 3,971,862, Cl. 427-329.000.

Fukutome, Satoru: *See—*
Murakami, Tomomi; Nagata, Hiromichi; Funazawa, Masakazu; and Fukutome, Satoru, 3,971,207.

Funae, Yoshihiko: *See—*
Mita, Itaru; Okumura, Shigeo; Yamabe, Shigeru; Funae, Yoshihiko; and Matumoto, Junzo, 3,971,828.

Funazawa, Masakazu: *See—*
Murakami, Tomomi; Nagata, Hiromichi; Funazawa, Masakazu; and Fukutome, Satoru, 3,971,207.

G. D. Searle & Co.: *See—*
Baran, John S.; and Pitzele, Barnett S., 3,971,827.

Gadd, Ronald O. C.; Quarmby, Robert C.; and Smith, Frank R., to USM Corporation. Self-adjusting roll wipers for a shoe lasting machine. 3,971,089, Cl. 12-8.300.

Gaetzi, Karl; and Fischer, Hanspeter, to Ciba-Geigy Corporation. Composition for the regulation of plant growth. 3,971,647, Cl. 71-76.000.

Gaines, John W.: *See—*
Packard, Norman M.; and Gaines, John W., 3,971,165.

Gallo, William C. Rotary valve assembly. 3,971,402, Cl. 137-382.000.

Gambut, Michel: *See—*
Detraz, Jacques; and Gambut, Michel, 3,971,264.

Gaminde, Juan: *See—*
Petrie, Robert D.; Wensley, Thomas E.; Watkins, Charles; and Gaminde, Juan, 3,971,556.

Ganellin, Charon Robin: *See—*
Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, 3,971,786.

Gans, Charles C. Knock-down drawer unit. 3,971,608, Cl. 312-257.00R.

Gardetto, Alfred D. Base marker for baseball. 3,971,558, Cl. 273-25.000.

Garmaise, David Lyon: *See—*
Prasad, Raj Nandan; and Garmaise, David Lyon, 3,971,849.

Garrett Corporation, The: *See—*
Schwent, Glennon V., 3,971,208.

Garrett, Douglas R.: *See—*
Millar, James S.; and Garrett, Douglas R., 3,971,405.

Garsky, Victor M., to American Home Products Corporation. [2-Methyl-Ala[8]]LRH. 3,971,737, Cl. 260-112.5LH.

Garza, Jose G., to Raymond Lee Organization, Inc., The, a part interest. Weaving frame supporting device. 3,971,109, Cl. 28-15.000.

Garziera, Gastone, to Ing. C. Olivetti & C., S.p.A. Skew compensation for a magnetic card reading-writing unit. 3,972,027, Cl. 340-172.500.

Gates Rubber Company, The: *See—*
Batzer, Richard R.; and Redmond, John D., 3,971,197.

Gau, Gerald S.; and Zamora, Mario, to Halliburton Company. Simulator for an oil well circulation system. 3,971,926, Cl. 235-184.000.

Gavrilova, Ivana: *See—*
Hudecek, Slavko; and Gavrilova, Ivana, 3,971,744.

Gay-Chatain, Guillaume Antonin; and Montjallard, Paul Rene Marius, to Etat Francais. Apparatus for electrically connecting two conductors between two rotatable elements. 3,971,460, Cl. 191-45.00R.

Gaz de France: *See—*
Cornil, Jean-Philippe, 3,971,399.

Gazuit, Georges, to NRM Corporation. Manufacture of radial-carcass tires. 3,971,694, Cl. 156-415.000.

Geary, Henry R.: *See—*
Hudson, Eugene; and Geary, Henry R., 3,971,407.

Gelber, Robert M.; and Small, Edward A., Jr., to Optical Coating Laboratory, Inc. Liquid crystal display device and method. 3,971,869, Cl. 422-195.000.

Gemmell, Frank S.; and Fried, Mark A., to Motorola, Inc. Detonation system and method. 3,971,317, Cl. 102-21.000.

General American Transportation Corporation: *See—*
Mowatt-Larssen, Erling; and Lapikas, Thomas S., 3,971,491.

General Atomic Company: *See—*
Bokros, Jack C., 3,971,134.

General Dynamics Corporation: *See—*
Regalbuto, John A., 3,971,875.

General Electric Company: *See—*
Bialous, Charles A.; Luce, John B.; and Mark, Victor, 3,971,756.
Calkins, Thornton R., 3,971,863.
Chambers, George S.; and Lane, Lawrence J., 3,971,978.
Hudson, Eugene; and Geary, Henry R., 3,971,407.
Hurko, Bohdan, 3,971,361.
Kushner, Gerald J.; and Nininger, John H., III, 3,971,500.
Lennon, David C., 3,971,907.
Taylor, Franklyn H.; and Finck, Edward J., 3,971,219.

General Foods Corporation: *See—*
Fruda, Ivan; and Trumbetas, Jerome Francis, 3,971,857.

Gentil, Henri. Hand loom. 3,971,417, Cl. 139-34.000.

Gentil, Robert, to Industrielle de Constructions Mobiles. Prefabricated construction. 3,971,172, Cl. 52-28.000.

Gentili, Claudio: *See—*
Cislaghi, Ezio; Gentili, Claudio; and Maccario, Ermanno, 3,972,033.

Genuit, Luther L., to Honeywell Information Systems, Inc. Switching regulator employing biased saturable core reactors. 3,971,975, Cl. 321-18.000.

Georgia-Pacific Corporation: *See—*
Rasmussen, Holgar, 3,971,237.

Gerber Products Company: *See—*
Myklebust, Paal, 3,971,913.

Gerstenacker, Klaus-Dieter: *See—*
von Klenck, Jurgen; Michel, Erich; and Gerstenacker, Klaus-Dieter, 3,971,704.

Gesellschaft fur Kernforschung m.b.H.: *See—*
Hild, Werner; Krause, Helmut; Scheffler, Knut; Gusten, Hans; Gilbert, Ernst; and Koster, Rainer, 3,971,717.
Meier, Gerhard, 3,971,732.

Gestra-KSB Vertriebsgesellschaft mbH & Co. Kommanditgesellschaft Bremen: *See—*
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Geyken, Erwin: *See—*
Schneider, Siegfried; Thate, Kurt; Geyken, Erwin; Kempe, Horst; and Macher, Stephan, 3,971,115.

GF Business Equipment, Inc.: *See—*
Donahue, Charles R.; and Williams, Philip J., 3,971,182.

Giangiulio, Clayton. Oil clarification system. 3,971,508, Cl. 233-4.000.

Gibson, Robert T., to Professional Surgical Manufacturing Company. Laparotomy sponge. 3,971,381, Cl. 128-296.000.

Giguere, Winfield Joseph; and Padnes, David Richard, to Bell Telephone Laboratories, Incorporated. Method of fabricating a printed wiring board assembly. 3,971,127, Cl. 29-626.000.

Gilbert, Ernst: *See—*
Hild, Werner; Krause, Helmut; Scheffler, Knut; Gusten, Hans; Gilbert, Ernst; and Koster, Rainer, 3,971,717.

Gilding, Denis Keith: *See—*
Goodrich, George E., Jr.; Cain, Earl S.; Goodrich, George E., Sr.; Gilding, Denis Keith; and Carlson, Jerome A., 3,971,499.

Gillis, Robert E. Bubble machine with protective transparent dome. 3,971,157, Cl. 46-7.000.

Giordano, Antonio, to Viges S.p.A. Apparatus for applying a sole to an upper in the manufacture of shoes. 3,971,087, Cl. 12-1.00A.

Giraudi, Walter: *See—*
Rogora, Edoardo; and Giraudi, Walter, 3,971,958.

Glacier Metal Company Limited, The: *See—*
Rudge, Sydney James, 3,971,598.

Glaxo Laboratories Limited: *See—*
Cook, Martin Christopher; Gregory, Gordon Ian; and Bradshaw, Janice, 3,971,778.
Cowley, Brian Richard; and Martin, David George, 3,971,775.

Gleason Works, The: *See—*
Hunkeler, Ernst J., 3,971,293.

Godley, Augustus P., to Raymond International Inc. Installation of expanded base piles. 3,971,227, Cl. 61-53.000.

Goffe, William L., to Xerox Corporation. Imaging process employing friction charging in the presence of an electrically insulating liquid. 3,971,658, Cl. 96-1.00C.

Golding, Leonard: *See—*
Heiges, Melville Lynwood, Jr.; Golding, Leonard; and Banyasz, Bela, 3,972,065.

Golovko, Georgy Anatolievich. Method of separating krypton-xenon concentrate from air. 3,971,640, Cl. 55-66.000.

Goodren Products Corporation: *See—*
Tanney, Oliver Morley, 3,971,149.

Goodrich, George E., Jr.; Cain, Earl S.; Goodrich, George E., Sr.; Gilding, Denis Keith; and Carlson, Jerome A., to Tribotech. Bonding tool. 3,971,499, Cl. 228-54.000.

Goodrich, George E., Sr.: *See—*
Goodrich, George E., Jr.; Cain, Earl S.; Goodrich, George E., Sr.; Gilding, Denis Keith; and Carlson, Jerome A., 3,971,499.

Goodsmith, Dale H.; and Ladouceur, Harold A., to Multifastener Corporation. Fastener installation head. 3,971,116, Cl. 29-208.00D.

Gopinath, Bhaskarpillai; and Kurshan, Robert Paul, to Bell Telephone Laboratories, Incorporated. Recursive detector-oscillator circuit. 3,971,998, Cl. 328-167.000.

Gorrafa, Adly Abdel-Moniem, to Du Pont de Nemours, E. I., and Company. Set apparatus for treating yarn and process for stringup thereof. 3,971,108, Cl. 28-1.400.

Goto, Issei; and Hara, Suzo, to Parker Sangyo Co., Ltd. Method for preventing the adhesive deposition of sludge on the surface of parts of a plant for treating metal surfaces. 3,971,539, Cl. 250-529.000.

Goto, Kazuo: *See—*
Araki, Kunio; Sasaki, Takashi; and Goto, Kazuo, 3,971,711.

Goto, Kenji; and Shibata, Norio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Indicator of vehicle service intervals. 3,972,022, Cl. 340-52.00D.

Gottfried, Arthur H.; Jasper, Louis J., Jr.; and Tancredi, John J., to United States of America, Army. Planar ring bar travelling wave tube. 3,971,966, Cl. 315-39.300.

Gottfried, Arthur H.: *See—*
Baker, Halsted W.; and Gottfried, Arthur H., 3,971,965.

Gourdeau, William F.: *See—*
Johnson, Philip Paul; Gourdeau, William F.; and Hahn, Ronald E., 3,971,540.

Gouyou-Beauchamps, Jacques, to Saunier Duval. Safety device for instant water heater. 3,971,344, Cl. 122-504.000.

Graco Inc.: *See—*
Quarve, Vernon Kenneth, 3,971,404.

Gradeff, Peter S., to Rhodia, Inc. Process for the semihydrogenation of citral to citronellal. 3,971,830, Cl. 260-601.00R.

Graf, Robert J.: *See—*
Andreaggi, Joseph R.; Graf, Robert J.; and Relis, Matthew J., 3,972,068.

Graham, Glenn N., to Wyott Corporation. Deep fat fryer. 3,971,307, Cl. 99-403.000.

Graham, Paul L.: *See—*
Havelka, Steven E.; Graham, Paul L.; and Matschke, Carl L., 3,971,186.

Great Dane Trailers, Inc.: *See—*
Yglesias, James Raymon, 3,971,590.

Green, George Edward; and Stark, Bernard Peter, to Ciba-Geigy Corporation. Anaerobically-curing adhesives. 3,971,765, Cl. 260-78.00A.

Green, Philip S., to Stanford Research Institute. Linear transducer array for ultrasonic image conversion. 3,971,962, Cl. 310-8.100.

Greenleaf, Charles W. Breakwater system for creating artificial sandbars. 3,971,221, Cl. 61-5.000.

Greer, Kent Reaney; Hampson, William Rodney; and Smith, Benjamin James, to Imperial Chemical Industries Limited. Method for forming double-walled units. 3,971,687, Cl. 156-221.000.

Gregory, Gordon Ian: *See—*
Cook, Martin Christopher; Gregory, Gordon Ian; and Bradshaw, Janice, 3,971,778.

Gribnitz, Harry J.: *See—*
Buix, Louis F.; Gribnitz, Harry J.; and Hohner, Gary A., 3,971,629.

Griffies, David R.; Robison, Russell O.; and Taylor, Robert W., to Rockwell International Corporation. Saber saw. 3,971,132, Cl. 30-393.000.

Griffin, Raymond E. Manually operable self-closing valve. 3,971,541, Cl. 251-347.000.

Griffith, Robert E., Jr., to Burke, Robert, a part interest. Soil stabilization. 3,971,222, Cl. 61-36.00R.

Grinberg, Jan: *See—*
Seidman, Ady; Avrahami, Zohar; Sheinfux, Benjamin; Grinberg, Jan; and Shimoni, Uri, 3,971,942.

Grix, Arthur R., to Wagner Electric Corporation. Electro-pneumatic air brake valve and system compatible with a skid control system. 3,971,596, Cl. 303-40.000.

Grolman, Bernard: *See—*
Richards, William; and Grolman, Bernard, 3,971,073.

Gros-ite Industries, Inc.: *See—*
Everett, George, 3,971,620.

Grossman, David D.: *See—*
Carrubba, Francis P.; Franaszek, Peter A.; and Grossman, David D., 3,971,987.

Grotz, Charles A., to Boeing Company, The. Method of and apparatus for controlling flow attachment to the wing and flap surfaces of an upper surface blowing type aircraft. 3,971,534, Cl. 244-42.0CD.

Grundell, Carl-Erik. Box-shaped product. 3,971,502, Cl. 229-14.00R.

Grychtol, Klaus: *See—*
Baumann, Hans; Grychtol, Klaus; and Oberlinner, Andreas, 3,971,821.

GTE Laboratories Incorporated: *See—*
Buhrer, Carl F., 3,971,126.

GTE Sylvania Incorporated: *See—*
Duncan, Alexander William, 3,971,584.
LaBudde, Richard G., 3,971,585.

Guitard, Francois: *See—*
Boel, Charles; Cottin, Jean-Pierre; and Guitard, Francois, 3,971,175.

Gulf Oil Corporation: *See—*
Matthews, Charles W., 3,971,635.
Matthews, Charles W., 3,971,636.
Matthews, Charles W., 3,971,637.
Matthews, Charles W., 3,971,638.
Matthews, Charles W., 3,971,639.

Gunther, Wolfgang H. H., to Xerox Corporation. Organo-chalcogen compositions. 3,971,742, Cl. 260-2.00M.

Gunther, Wolfgang H. H.: *See—*
Schank, Richard L.; and Gunther, Wolfgang H. H., 3,971,316.

Gusack, James A.: *See—*
Crafford, Joseph C.; Dowling, Vincent J., Jr.; and Gusack, James A., 3,971,245.

Gusten, Hans: *See—*
Hild, Werner; Krause, Helmut; Scheffler, Knut; Gusten, Hans; Gilbert, Ernst; and Koster, Rainer, 3,971,717.

Gyori, Steven A.: *See—*
Sandrock, Harold E.; Stark, Edward W.; and Gyori, Steven A., 3,971,630.

H. H. Hawkins Ltd.: *See—*
Hawkins, Henry H., 3,971,967.

Haas, George A.: *See—*
Thomas, Richard E.; and Haas, George A., 3,971,110.

Haas, Helmut; and Wolf, Manfred, to Klockner-Humboldt-Deutz Aktiengesellschaft. Ball mill with energizing body on the wearing plate. 3,971,515, Cl. 241-175.000.

Habeck, Gerald E.; and Kiser, Fred W., to Timesavers, Inc. Belt position sensor for wide belt sanding machine. 3,971,166, Cl. 51-135.0BT.

Habermeier, Jurgen: *See—*
Porret, Daniel; Habermeier, Jurgen; and Baumann, Dieter, 3,971,813.

Habig, Alan L. Process and apparatus for treating and transferring metal in the liquid state. 3,971,549, Cl. 266-215.000.

Hagglund, Anders Carl Gustaf: *See—*
Ahlberg, Erik; Carlvik, Ingvar; Liljekvist, Bernt Soren; and Hagglund, Anders Carl Gustaf, 3,971,447.

Hagino, Minoru: *See—*
Hara, Katsuo; Hagino, Minoru; and Sukegawa, Tokuzo, 3,972,060.

Hahn, Alfred: *See—*
Brather, Wolfgang; and Hahn, Alfred, 3,971,949.

Hahn, Ronald E.: *See—*
Johnson, Philip Paul; Gourdeau, William F.; and Hahn, Ronald E., 3,971,540.

Halford, George C.; and Michael, Robert E. Tongue and jaw positioning article. 3,971,370, Cl. 128-136.000.

Hall, Jerry L.: *See—*
Jones, Robert D.; and Hall, Jerry L., 3,971,714.

Hall, Ronald D., to United States of America, Navy. Method for making beam leads. 3,971,428, Cl. 164-46.000.

Halliburton Company: *See—*
Gau, Gerald S.; and Zamora, Mario, 3,971,926.

Hamamatsu Terebi Kabushiki Kaisha: *See—*
Hara, Katsuo; Hagino, Minoru; and Sukegawa, Tokuzo, 3,972,060.

Hamilton, James L.: *See—*
Kirsch, Jordan; and Hamilton, James L., 3,971,928.

Hamilton, Joseph R., to Lynch Corporation. Rotary actuator. 3,971,480, Cl. 214-1.0BB.

Hamisch, Paul H., Sr., to Monarch Marking Systems, Inc. Tag attaching apparatus. 3,971,497, Cl. 227-67.000.

Hammann, Ingeborg: *See—*
Widdig, Arno; Hammann, Ingeborg; and Kaspers, Helmut, 3,971,804.

Hammond Corporation: *See—*
Schreier, Wilford R., 3,971,284.

Hampson, William Rodney: *See—*
Greer, Kent Reaney; Hampson, William Rodney; and Smith, Benjamin James, 3,971,687.

Handy Chemicals Limited: *See—*
de Waltoff, Lionel, 3,971,861.

Hansen, Frederick C., to Porelon, Inc. Macroporous microporous marking structure. 3,971,315, Cl. 101-333.000.

Hanson, Cameron G. Illuminated twirling toy. 3,971,158, Cl. 46-228.000.

Hara, Katsuo; Hagino, Minoru; and Sukegawa, Tokuzo, to Hamamatsu Terebi Kabushiki Kaisha. Semiconductor cold electron emission device. 3,972,060, Cl. 357-30.000.

Hara, Suzo: *See—*
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Hardey, Donald Paul. Die casting machine. 3,971,432, Cl. 164-318.000.

Harkness, Joseph R.; and Couchman, Robert, Jr., to Briggs & Stratton Corporation. Bendix-type engine starter with mechanical lookout to prevent undesired starting of engine. 3,971,353, Cl. 123-179.00K.

Harms, John F. Device for use with fishing tackle. 3,971,153, Cl. 43-43.130.

Harris, Dewey F., to Kaman Sciences Corporation. Phase stable transmission cable. 3,971,880, Cl. 174-36.000.

Harris, John L.; and Nelson, Bror H., to Aluminum Company of America. Packaging apparatus. 3,971,469, Cl. 206-452.000.

Hart, Joseph J.: *See—*
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Hartmann, Peter; and Theidel, Hans, to Bayer Aktiengesellschaft. Benzodifuran compounds. 3,971,731, Cl. 252-301.320.

Harvey, Michael J.: *See—*
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Hase, Alfred Max. Electrical load transfer control system. 3,971,957, Cl. 307-64.000.

Hasegawa, Tadashi; and Yamaguchi, Tetsuo. Process for manufacturing a composite foamed synthetic resin bowling pin. 3,971,837, Cl. 264-46.600.

Hashimoto, Syunichi. Series connector. 3,971,615, Cl. 339-98.000.

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Hashimoto, Tohru; Kawarada, Akira; and Tamura, Sachiko, to Rikagaku Kenkyusho. Plant growth modifier and a process for preparation thereof. 3,971,651, Cl. 71-122.000.

Hasson, Harrith M. Surgical closure. 3,971,384, Cl. 128-335.000.

Hastings, Donald R., to Nordson Corporation. Apparatus for electrostatically spraying highly electrically conductive water-based coating material. 3,971,337, Cl. 118-629.000.

Hatano, Itaru: *See—*
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Hauck, Frederic P.; Sundeen, Joseph E.; and Reid, Joyce, to E. R. Squibb & Sons, Inc. Cyclitolamines. 3,971,823, Cl. 260-490.000.

Hauni-Werke Korber & Co., KG: *See—*
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Havelka, Steven E.; Graham, Paul L.; and Matschke, Carl L., to Electronic Memories and Magnetics Corporation. Wedge lock unit. 3,971,186, Cl. 52-753.00G.

Hawkins, Edwin Francis, to Allied Chemical Corporation. Water-wettable wax composition and process for producing the same. 3,971,733, Cl. 252-311.000.

Hawkins, Henry H., to H. H. Hawkins Ltd. Fluorescent lamp installation having separate filament transformers and remotely located ballast. 3,971,967, Cl. 315-97.000.
Hawkins, Ronald G., to Aluminum Company of America. Damping spacer for three conductor bundle. 3,971,881, Cl. 174-42.000.
Haynes, Harold L.; and Harvey, Michael J., to Owens-Corning Fiberglas Corporation. Texturizing size and glass fibers coated with same. 3,971,871, Cl. 428-392.000.
Hays, Bill J., to Bill J. Hays International Inc. Distributor means for high speed engines. 3,971,350, Cl. 123-117.00R.
Hays, Robert A. Portable bar adapted for mounting electronic equipment. 3,971,889, Cl. 179-1.0AT.
Heaton, Roy C.: *See—*
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Hedgewick, Peter; Suhr, Donald C.; Domaracki, John F.; and Arnott, Robin A., to International Tools (1973) Ltd. Roadway marker. 3,971,623, Cl. 350-103.000.
Heiges, Melville Lynwood, Jr.; Golding, Leonard; and Banyasz, Bela, to Communications Satellite Corporation (Comsat). Method of testing color television systems. 3,972,065, Cl. 358-10.000.
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Helgorsky, Jacques; and Leveque, Alain, to Rhone-Poulenc Industries. Process for liquid/liquid extraction of gallium. 3,971,843, Cl. 423-112.000.
Helms, Charles R.; and Patrick, William D., to Container Corporation of America. Carton partition arrangement. 3,971,468, Cl. 206-193.000.
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Herd, David P.; and Fowler, John H., to McEvoy Oilfield Equipment Co. Underwater well completion method and apparatus. 3,971,576, Cl. 285-87.000.
Herrera, Jose Pardo. Device for changing the position of the head section of hide-away bed frames. 3,971,078, Cl. 5-66.000.
Herrick, Gary Dean: *See—*
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Herz, Arthur H.; and Daniel, Daniel S., to Eastman Kodak Company. Silver halide complexing agents of sulfones, nitriles, and onium salts. 3,971,662, Cl. 96-76.00R.
Hess, Hans-Jurgen E.; Johnson, Michael R.; Bindra, Jasjit S.; and Schaaf, Thomas K., to Pfizer Inc. 15-Substituted-ω-pentanorprostaglandins. 3,971,826, Cl. 260-520.00B.
Hess, William Emil, Jr.; and Vella-Coleiro, George Philip, to Bell Telephone Laboratories, Incorporated. Phase correcting drive circuit for a magnetic bubble field-access memory. 3,972,037, Cl. 340-174.0TF.
Hessert, James E.; and Clampitt, Richard L., to Phillips Petroleum Company. Method for treating subterranean formations with cellulose ether-polyacrylamide aqueous gels. 3,971,440, Cl. 166-270.000.
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Heyer, Robert E.; and Bolter, Bernard J., to E. R. Squibb & Sons, Inc. Shielding container. 3,971,955, Cl. 250-507.000.
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Hideshima, Yasuhiro; and Toyoshima, Masakatsu, to Sony Corporation. Remote control system for radio receiver. 3,971,986, Cl. 325-37.000.
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Hild, Werner; Krause, Helmut; Scheffler, Knut; Gusten, Hans; Gilbert, Ernst; and Koster, Rainer, to Gesellschaft fur Kernforschung m.b.H. Conditioning highly radioactive solidified waste. 3,971,717, Cl. 210-59.000.
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Hilsum, Cyril; and Mears, Adrian Leonard, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Display systems. 3,972,040, Cl. 340-324.00M.
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Hinnergardt, Larry C., to United States of America, Army. Method of producing freeze-dried, cooked beef steak and resulting product. 3,971,854, Cl. 426-281.000.
Hirai, Koji; Okamura, Takayuki; and Fujii, Kiyoshi, to Kuraray Co., Ltd. Synthetic polyisoprene rubber latex. 3,971,746, Cl. 260-29.70D.
Hirosawa, Koichiro: *See—*
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Hirt, Adam; and Roderer, Herbert, to Robert Bosch G.m.b.H. Magneto generator supplied battery-less electric power supply system particularly for motor vehicles. 3,971,977, Cl. 322-1.000.
Hitachi Electronics Ltd.: *See—*
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Hohmann, Walter; Wunderlich, Klaus; and Bien, Hans-Samuel, to Bayer Aktiengesellschaft. Anthraquinone dyestuffs. 3,971,812, Cl. 260-380.000.
Hohner, Gary A.: *See—*
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Hollander, James Fisher. Simulation apparatus. 3,971,142, Cl. 35-22.00R.

Hollis, John Edward; and Barrett, John Albert, to Plessey Handel und Investments AG. Telephone conference arrangement. 3,971,895, Cl. 179–1CN.

Holly, Frederick W.: *See—*
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Holmala, Aulis: *See—*
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Holmqvist, Magnus Allan. Method of making a composite baking mold. 3,971,118, Cl. 29-412.000.

Holtzberg, Frederic; Mayadas, Ashok F.; Thompson, William A.; and von Molnar, Stephan, to International Business Machines Corporation. Detection of magnetic domains by tunnel junctions. 3,972,035, Cl. 340-174.0TF.

Homsy, Charles A. Implantable structure and method of making same. 3,971,670, Cl. 156-196.000.

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Hopp, Gene P., to Motorola, Inc. Mounting assemblies for a plurality of transistor integrated circuit chips. 3,972,062, Cl. 357-68.000.

Hoppe, Walter, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V. Corpuscular beam microscope, particularly electron microscope, with adjusting means for changing the position of the object to be imaged or the image of the object. 3,971,936, Cl. 250-311.000.

Hoppey, Thomas. Forklift attachment. 3,971,485, Cl. 214-313.000.

Horeth, Mathias, to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Process of extracting a hot slab from a continuous casting mould and an apparatus therefor. 3,971,429, Cl. 164-82.000.

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Howard, Shirly L., to International Telephone and Telegraph Corporation. Adaptive clutter velocity cancellation system for pulsed digital MTI system. 3,972,041, Cl. 343-7.700.

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Hoyland, Trevor Barrie, to Thurne Engineering Company Limited. Machine for inserting objects into bags. 3,971,191, Cl. 53-112.00B.

Huang, Kwang Ta; and Brooks, James L., to United States of America, Navy. VLF antenna tower base insulator. 3,971,878, Cl. 174-30.000.

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Hudecek, Slavko; and Gavrilova, Ivana, to Ceskoslovenska akademie ved. Method for preparation of emulsions, concentrated dispersions and pastes. 3,971,744, Cl. 260-23.0EM.

Hudson, Eugene; and Geary, Henry R., to General Electric Company. Means for locating suction valve. 3,971,407, Cl. 137-516.150.

Huessy, Eric G., to Peavey Company. Technique for preparing edible food flavor pellets. 3,971,859, Cl. 426-618.000.

Hufton, Austen B., to Servicemaster Industries, Inc. Vacuum cleaner including dust bag and filter. 3,971,643, Cl. 55-372.000.

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Humbert, Daniel; and Ratouis, Roger, to Roussel-UCLAF. Pyridine derivative, processes of preparation and pharmaceutical compositions. 3,971,798, Cl. 260-295.0CA.

Hunkeler, Ernst J., to Gleason Works, The. Anti-backlash mechanism for generating train of gear cutting machine. 3,971,293, Cl. 90-5.000.

Hurko, Bohdan, to General Electric Company. Low thermal mass cooking utensil. 3,971,361, Cl. 126-390.000.

Hurt, James S. Belt transfer means for cigarettes or the like. 3,971,466, Cl. 198-20.00C.

Hurtes, Walter. Apparatus and procedure for manufacturing articles having a non-woven pile. 3,971,685, Cl. 156-72.000.

Husson, Frank, Jr., to Applied Oceanographic Technology Corporation. Fishing lure. 3,971,152, Cl. 43-42.060.

Hutson, Jearld L. Four quadrant symmetrical semiconductor switch. 3,972,014, Cl. 357-39.000.

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Hyler, John H., to Westinghouse Air Brake Company. Torque-limited driving arrangement for scraper elevator. 3,971,147, Cl. 37-8.000.

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Ichiyanagi, Toshikazu, to Canon Kabushiki Kaisha. Apparatus for controlling the synchronous drive for direct-current motors. 3,971,974, Cl. 318-341.000.

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Inada, Masami; and Okumura, Shuji, to Aisin Seiki Kabushiki Kaisha. Vapor fuel control apparatus. 3,971,406, Cl. 137-493.400.

Inakura, Tuneho; and Doi, Masayuki, to Nippondenso Co., Ltd. Power transmission device. 3,971,266, Cl. 74-675.000.

Inami, Mamoru; Tanaka, Yoshiaki; and Ono, Tsuyoshi, to Victor Company of Japan, Limited. Pulse amplifier. 3,971,961, Cl. 307-268.000.

Inbar, Michael; and Shinitzky, Meir, to Yeda Research & Development Co. Ltd. Method of detecting abnormal behavior of mammalian cells. 3,971,952, Cl. 250-461.00B.

Industrielle de Constructions Mobiles: *See—*
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Isayama, Katsuhiko; and Hatano, Itaru, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Vulcanizable silylether terminated polymer. 3,971,751, Cl. 260-37.00R.
Ishii, Masaaki, to Canon Kabushiki Kaisha. Endless tape cartridge. 3,971,523, Cl. 242-55.19A.
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Chibata, Ichiro; Miyoshi, Munetugu; Ito, Hiroshi; Fujii, Toshiyuki; and Kawashima, Keisuke, 3,971,822.
Ito, Tetsuo. Damper for string instrument. 3,971,287, Cl. 84-453.000.
Iwasaki Tsushinki Kabushiki Kaisha: *See—*
Sekiguchi, Kouichi, 3,971,896.
Iwatsu Electric Co., Ltd.: *See—*
Hijikata, Tokuhisa; and Sekiguchi, Koichi, 3,971,898.
Izumitani, Tetsuro: *See—*
Tajima, Hidemi; Asahara, Yoshiyuki; and Izumitani, Tetsuro, 3,971,723.
J. M. Huber Corporation: *See—*
Almagro, Guillermo; Bertorelli, Orlando L.; Mays, Robert K.; Williams, Lloyd E.; and Zimmerman, Howard F., Jr., 3,971,631.
Bertorelli, Orlando L.; Mays, Robert K.; Williams, Lloyd E.; and Zimmerman, Howard F., Jr., 3,971,727.
Jackson, Dennis E., to Naremco, Inc. Prevention of fungi and molds in poultry and animal feedstuffs with methyl rosaniline chloride additive. 3,971,855, Cl. 426-321.000.
Jackson, Jean Andre, Jr.: *See—*
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Jakeman, Eric; and Pusey, Peter Nicholas, to National Research Development Corporation. Measurement of surface roughness. 3,971,956, Cl. 250-571.000.
Japan Atomic Energy Research Institute: *See—*
Araki, Kunio; Sasaki, Takashi; and Goto, Kazuo, 3,971,711.
Jaquet, James R., to Infinetics, Inc. Ferromagnetic metal detector utilizing gradiometers positioned on opposite sides of the detection area with overlapping sensitivity. 3,971,983, Cl. 324-41.000.
Jasper, Louis J., Jr.: *See—*
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Jaworski, Eugene: *See—*
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Jehle, Robert E., to United States of America, Navy. Led image tube light valve. 3,971,931, Cl. 250-213.00R.
Jenny, Walter: *See—*
Desai, Nalin Binduprasad; Jayaraman, Ponnusami; Ramanathan, Visvanathan; Artz, Klaus; Naik, Navnitrai Nagarji; and Jenny, Walter, 3,971,740.
Jervis, James E.: *See—*
Levinsohn, Richard, deceased; Levinson, Joseph, administrator-with-will-annexed; and Jervis, James E., 3,971,566.
Jeunehomme, Michel L.; and Essad, Robert A., to Bendix Corporation, The. Ultraviolet radiation monitor. 3,971,943, Cl. 250-372.000.
Jezl, James L.: *See—*
Peters, Edwin F.; Spangler, Michael J.; Michaels, Glenn O.; and Jezl, James L., 3,971,768.
Joerns Furniture Company: *See—*
Peterson, Warren J., 3,971,083.
Johansson, Rolf Anders Gunnar. Centrifugal clutch with engaging and releasing weights. 3,971,462, Cl. 192-105.0BA.
John Wyeth & Brother: *See—*
White, Alan Chapman; and Black, Robin Michael, 3,971,782.
John Wyeth & Brother Limited: *See—*
Archibald, John Leheup; Boyle, John Arnott; and Saunders, John Christopher, 3,971,787.
Archibald, John Leheup; Boyle, John Terence Arnott; and Saunders, John Christopher, 3,971,789.
Johnsen, Frank Birger, to Titan Separator A/S. Centrifuge comprising an outer drum and an inner rotor provided with a conveyor screw. 3,971,509, Cl. 233-7.000.
Johnson, Ben C., to Thermon Manufacturing Company. Preinsulated pipe assembly and pipeline. 3,971,416, Cl. 138-33.000.
Johnson, Bruce K.; and Whiteside, George D., to Polaroid Corporation. Follow focus intercept actuating system for photographic apparatus. 3,972,058, Cl. 354-149.000.
Johnson, Erlin J., to Minnesota Mining and Manufacturing Company. Thermoformable release liner. 3,971,866, Cl. 428-40.000.
Johnson & Johnson: *See—*
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Tritsch, Ludwig, 3,971,380.
Johnson, Michael R.: *See—*
Hess, Hans-Jurgen E.; Johnson, Michael R.; Bindra, Jasjit S.; and Schaaf, Thomas K., 3,971,826.
Johnson, Philip Paul; Gourdeau, William F.; and Hahn, Ronald E., to Whirlpool Corporation. Control valve and mounting assembly for an appliance. 3,971,540, Cl. 251-143.000.
Johnson, Robert H., to Motorola, Inc. Metal target detection system. 3,972,042, Cl. 343-17.2PC.
Johnson, Robert P., to Bendix Corporation, The. Digital time-off-event encoding system. 3,971,920, Cl. 235-92.0SH.
Johnson, Russell A.: *See—*
Devrick, Charles E.; Houmis, Nicholas J.; and Johnson, Russell A., 3,971,294.
Johnston, Norman W.: *See—*
Frechtling, Arthur C.; Johnston, Norman W.; and Shaw, Richard G., 3,971,753.
Jones, Everett E., to Boeing Company, The. Method for die forming strip material. 3,971,243, Cl. 72-385.000.
Jones, Howard: *See—*
Shen, Tsung-Ying; Jones, Howard; Mulvey, Dennis M.; and Dorn, Conrad P., 3,971,797.
Jones, Paul D.: *See—*
Uzelmeier, Christopher W.; and Jones, Paul D., 3,971,834.
Jones, Robert C.; and Anderson, Robert W. Mouthpiece extractor. 3,971,288, Cl. 84-453.000.
Jones, Robert D.; and Hall, Jerry L., to Intraco, Inc. Hopper screening apparatus. 3,971,714, Cl. 209-257.000.
Jones, Robert T., to United States of America, National Aeronautics and Space Administration. Oblique-wing supersonic aircraft. 3,971,535, Cl. 244-46.000.
Jung, Hans Wolf; Maul, Rudolf; Kintopf, Siegfried; Kloss, Wilfried; and Knapp, Reinhard, to Ciba-Geigy Corporation. Process for the manufacture of monomethyl-tin trichloride. 3,971,817, Cl. 260-429.700.
Jungfer, Leopold; Kautschitsch, Dieter; and Weber, Richard, to Akkumulatorenfabrik Dr. Leopold Jungfer, Firma. Battery testing apparatus. 3,971,980, Cl. 324-29.500.
Jurecic, Anton, to Pennwalt Corporation. X-ray opaque, enamel-matching dental filling composition. 3,971,754, Cl. 260-42.150.
Justin Huppe, Firma: *See—*
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Kaloi, Cyril M., to United States of America, Navy. Asymmetrically fed electric microstrip dipole antenna. 3,972,049, Cl. 343-829.000.
Kaloi, Cyril M., to United States of America, Navy. End fed electric microstrip quadrupole antenna. 3,972,050, Cl. 343-846.000.
Kalopissis, Gregoire: *See—*
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Kaps, Karl-Heinz: *See—*
Coldewey, Heiko; Ammazzalorso, Mario; and Kaps, Karl-Heinz, 3,971,427.
Karsh, Irving, to Bell & Howell Company. Tape centering methods and apparatus. 3,971,496, Cl. 226-3.000.

Kasahara, Fumio; and Takeshita, Kazuo, to Kimitsu Chemical Laboratory Co. Ltd.; and Showa Yakuhinkako Kabushiki Kaisha. Lubricating composition for mucosa or epidermis. 3,971,848, Cl. 424-180.000.

Kaspers, Helmut: *See—*
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Kawaguchi, Norio; and Yaehashi, Toshio. Circuit for driving a DC motor for a clock. 3,971,204, Cl. 58-23.00D.

Kawakita, Masaru: *See—*
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Kawarada, Akira: *See—*
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Keith, John C.: *See—*
Wenninger, Freddie W.; Morris, Donald E.; Kohoutek, Jindrich; Maitland, David S.; Clifford, Douglas M.; Schulte, Louis T.; and Keith, John C., 3,971,925.

Keizer, Eugene Orville, to RCA Corporation. Apparatus and methods for playback of color picture/sound records. 3,972,064, Cl. 358-4.000.

Kelley, Robert K. Pneumatic beam pumping unit. 3,971,213, Cl. 60-372.000.

Kelley, Wilson E., Jr.: *See—*
Berst, Albert H.; Wright, Robert; and Kelley, Wilson E., Jr., 3,971,413.

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Kempe, Horst: *See—*
Schneider, Siegfried; Thate, Kurt; Geyken, Erwin; Kempe, Horst; and Macher, Stephan, 3,971,115.

Kendall, Giles A.; and Wallace, William D., to Menasco Manufacturing Company; and Miner Enterprises, Inc. Shock absorber. 3,971,551, Cl. 267-65.00R.

Kennedy, Jesse: *See—*
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Kenney, Edward J.: *See—*
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Keough, Joan M.: *See—*
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Kerihuel, Jean Bernard: *See—*
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Kieley & Mueller, Inc.: *See—*
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Kienel, Joseph Edward. Label applying method. 3,971,686, Cl. 156-212.000.

Kimata, Yukinori: *See—*
Aoyama, Toshikazu; Kimata, Yukinori; Okasaka, Hotuma; Kodama, Hiroshi; and Yoda, Naoya, 3,971,752.

Kimitsu Chemical Laboratory Co. Ltd.: *See—*
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Kimmon Manufacturing Co., Ltd.: *See—*
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Kimura, Hirohumi: *See—*
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Kimura, Shoichi: *See—*
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Kimura, Yoshio; Mitsuoka, Hiroshi; and Hosono, Isamu, to Mitsubishi Denki Kabushiki Kaisha. Vapor cooled semiconductor device enclosed in an envelope having a compression mechanism for holding said device within said envelope. 3,972,063, Cl. 357-82.000.

Kinase, Takeo; Yano, Isamu; Okubo, Kanichi; Kitakoga, Hidetoshi; and Tayama, Hiromitsu, to Mitsubishi Denki Kabushiki Kaisha. Oil fence. 3,971,220, Cl. 61-1.00F.

King, William: *See—*
Brandt, James L.; King, William; Minford, James Dean; and Valchar, Clement E., 3,971,674.

Kinoshita, Koichi, to Kinoshita Laboratory. Radiography apparatus for forming an electrostatic latent image of a body to be examined by the ionization of gas. 3,971,937, Cl. 250-315.00A.

Kinoshita Laboratory: *See—*
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Kintopf, Siegfried: *See—*
Jung, Hans Wolf; Maul, Rudolf; Kintopf, Siegfried; Kloss, Wilfried; and Knapp, Reinhard, 3,971,817.

Kirsch, Jordan; and Hamilton, James L. Display system. 3,971,928, Cl. 240-2.100.

Kiser, Fred W.: *See—*
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Kishida, Takashi: *See—*
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Kinase, Takeo; Yano, Isamu; Okubo, Kanichi; Kitakoga, Hidetoshi; and Tayama, Hiromitsu, 3,971,220.

Kito, Katsumi, to Mitsubishi Denki Kabushiki Kaisha. Remote control system for passenger conveyors. 3,971,885, Cl. 178-6.800.

Klanderman, Bruce H.: *See—*
Van Meter, James P.; and Klanderman, Bruce H., 3,971,824.

Klazar, Jaroslav: *See—*
Turpie, Derek W. F.; and Klazar, Jaroslav, 3,971,104.

Kleinberg, Israel; Domokos, Alex; and Castaldi, Cosmo, to Alphametrics Ltd. Ultraviolet camera system for dental photography and mouthpieces therefor. 3,971,954, Cl. 250-475.000.

Klip, Johan, to Konijn Machinebouw B.V.; and Bagger-en Constructie Bedrijf Johan Klip B.V. Dredge pump. 3,971,513, Cl. 241-46.00R.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*
Haas, Helmut; and Wolf, Manfred, 3,971,515.

Kloss, Wilfried: *See—*
Jung, Hans Wolf; Maul, Rudolf; Kintopf, Siegfried; Kloss, Wilfried; and Knapp, Reinhard, 3,971,817.

Kluy, Werner: *See—*
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Knapp, Reinhard: *See—*
Jung, Hans Wolf; Maul, Rudolf; Kintopf, Siegfried; Kloss, Wilfried; and Knapp, Reinhard, 3,971,817.

Knauer, Gilbert: *See—*
Wines, Harry T.; Power, John J.; and Knauer, Gilbert, 3,971,969.

Knecht, George W., to Midland-Ross Corporation. Electrical connectors. 3,971,609, Cl. 339-14.00P.

Knowles, Charles R.; Miles, Leon H.; and Bell, Larry N., to Atlantic Richfield Company. Well completion in permafrost. 3,971,441, Cl. 166-285.000.

Kobayashi, Akiyoshi, to Toyoda Koki Kabushiki Kaisha. Feed mechanism for a machine tool. 3,971,258, Cl. 74-10.200.

Kobayashi, Osamu: *See—*
Akai, Kazuyuki; and Kobayashi, Osamu, 3,971,393.

Kobayashi, Tatsumi; Nishiwaki, Eiji; Yamazoe, Shigeharu; Hoshino, Mitsuyuki; Yoshino, Sadafumi; and Mikuma, Katsunori, to Nippon Soda Company Limited. Process for the production of diaminomaleonitrile. 3,971,820, Cl. 260-465.50R.

Kobe Steel Ltd.: *See—*
Ikegami, Yoshio; Kimura, Hirohumi; Kohge, Tadashi; Sakamoto, Katsuji; and Higashimoto, Takenbu, 3,971,519.

Kobler, Robert James, to AMP Incorporated. Electrical housing member. 3,971,613, Cl. 339-59.00R.

Kochanny, Gerald L., Jr.; and Chamberlin, Thomas A., to Dow Chemical Company, The. Chlorinating composition of chlorine monoxide in 1,1,1-trichloroethane. 3,971,730, Cl. 252-187.00R.

Kodama, Hiroshi: *See—*
Aoyama, Toshikazu; Kimata, Yukinori; Okasaka, Hotuma; Kodama, Hiroshi; and Yoda, Naoya, 3,971,752.

Koenig, Raymond C., to Champion International Corporation. Flip-top carton of trunk type for frozen ice cream and comestibles of similar consistency. 3,971,612, Cl. 229-37.00R.

Koenig, Stanley, to Atlantic Products Corporation. Combination identification card holder and luggage lock. 3,971,458, Cl. 190-41.00Z.

Kohge, Tadashi: *See—*
Ikegami, Yoshio; Kimura, Hirohumi; Kohge, Tadashi; Sakamoto, Katsuji; and Higashimoto, Takenbu, 3,971,519.

Kohoutek, Jindrich: *See—*
Wenninger, Freddie W.; Morris, Donald E.; Kohoutek, Jindrich; Maitland, David S.; Clifford, Douglas M.; Schulte, Louis T.; and Keith, John C., 3,971,925.

Koike, Hiroshi; Suzuki, Shoji; and Asakawa, Takeki. Electomagnetic rotary motion device and exposure control device using the same. 3,971,963, Cl. 310-154.000.

Kokusai Denshin Denwa Kabushiki Kaisha: *See—*
Nakagome, Yukio; Watanabe, Teruji; Fukui, Takasuke; and Suzuki, Shizuo, 3,971,981.

Kollmeyer, Willy D.: *See—*
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Komatsu, Fumito; and Yazima, Sinkichi, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Automatic stop device for tape recorders. 3,971,528, Cl. 242-191.000.

Komatsu, Toshiyoshi; and Chimura, Keizo, to Duskin Franchise Co., Ltd. Mop having a washing resistance. 3,971,093, Cl. 15-104.930.

Kondo, Toshiyuki, to Aisin Seiki Kabushiki Kaisha. Anti-skid brake control system. 3,971,595, Cl. 303-21.00F.

Kondos, George C.; and Angelou, Dimitrios I. Press for squeezing agricultural products. 3,971,310, Cl. 100-118.000.

Konigsberg, Eph: *See—*
United States of America, National Aeronautics and Space Administration; and Konigsberg, Eph, 3,972,038.

Konijn Machinebouw B.V.: *See—*
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Konsowski, Stephen G.: *See—*
Lindberg, Frank A.; Konsowski, Stephen G.; Shamash, Maurice B.; and Ponemone, Seymour J., 3,971,661.

Konstant, Anthony N., to Speedrack Inc. Rail-carrying storage racks. 3,971,476, Cl. 211-134.000.

Kornhauser, Murray, to Safety Consultants. Energy absorbing bumper system. 3,971,583, Cl. 293-71.00P.

Kosiarski, Joseph P.: *See—*
Buchoff, Leonard S.; Kosiarski, Joseph P.; and Dalamangas, Chris A., 3,971,610.

Kosmatka, Arthur J. Mooring device. 3,971,329, Cl. 114-230.000.

Koster, Rainer: *See—*
Hild, Werner; Krause, Helmut; Scheffler, Knut; Gusten, Hans; Gilbert, Ernst; and Koster, Rainer, 3,971,717.

Kottmann, Helmut, to Mahle GmbH. Piston rod-connecting rod interconnections for internal combustion engines. 3,971,355, Cl. 123-197.00A.

Kowalski, Carl D.; Finn, Lawrence R.; and Yawberg, Richard C., to Owens-Corning Fiberglas Corporation. Intermittently operable rotary chopping apparatus for matted fibrous material. 3,971,277, Cl. 83-176.000.

Kramer, Richard R.: *See—*
Ellis, Paul H.; and Kramer, Richard R., 3,971,285.

Krantz, Kermit E., to Ortho Pharmaceutical Corporation. Expansible tampon. 3,971,378, Cl. 128-285.000.

Krasnov, Mikhail Mikhailovich. Method of non-surgical treatment of cataracts. 3,971,382, Cl. 128-303.100.

Krause, Helmut: *See—*
Hild, Werner; Krause, Helmut; Scheffler, Knut; Gusten, Hans; Gilbert, Ernst; and Koster, Rainer, 3,971,717.

Krauss-Maffei Aktiengesellschaft: *See—*
Winkle, Gunther; Schwarzler, Peter; Otto, Peter H.; Molzer, Peter; and Walkner, Christian, 3,971,537.

Kruger, Wilm; Schatka, Gunther; and Pietruska, Joachim, to AGFA-Gevaert, A.G. Fixing arrangement for fusing tower images. 3,971,912, Cl. 219-216.000.

Kuhlmey, Herbert: *See—*
Briska, Marian; Hoffmeister, Wolfgang; and Kuhlmey, Herbert, 3,971,683.

Kulig, Stanislaw, to Oswdek Badawczo-Rozwojowy Przemyslu Budowy Chemicznych Cebea. Piston assembly with compression and guiding rings. 3,971,298, Cl. 92-248.000.

Kuraray Co., Ltd.: *See—*
Hirai, Koji; Okamura, Takayuki; and Fujii, Kiyoshi, 3,971,746.

Kurisu, Katsuyasu, to Nissan Motor Co., Ltd. Manual automotive transmission. 3,971,265, Cl. 74-475.000.

Kurshan, Robert Paul: *See—*
Gopinath, Bhaskarpillai; and Kurshan, Robert Paul, 3,971,998.

Kushner, Gerald J.; and Nininger, John H., III, to General Electric Company. Method of metallurgically joining tubing to a wall segment. 3,971,500, Cl. 228-154.000.

Kwiatkowski, Gerald M.: *See—*
Mojden, Wallace W.; Davila, Jose E.; Hooper, George W.; Kwiatkowski, Gerald M.; and Pantel, Howard W., Jr., 3,971,189.

La Technique Integrale S.A.: *See—*
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LaBudde, Richard G., to GTE Sylvania Incorporated. Load engaging and gripping apparatus. 3,971,585, Cl. 294-88.000.

Ladouceur, Harold A.: *See—*
Goodsmith, Dale H.; and Ladouceur, Harold A., 3,971,116.

Lambert, Douglas N.; and Bennett, Richard H. Ultraviolet water purifier. 3,971,947, Cl. 250-437.000.

Lamlee, Stewart. Interchangeable-face devices and method of making same. 3,971,156, Cl. 46-1.00L.

Lampkin, Curtis M., to D. H. Baldwin Company. Light diffuser for photovoltaic cell. 3,971,672, Cl. 136-89.000.

Lane, Joseph J., to Arctic Enterprises, Inc. Collector for a power lawnmower. 3,971,198, Cl. 56-202.000.

Lane, Lawrence J.: *See—*
Chambers, George S.; and Lane, Lawrence J., 3,971,978.

Langdon, William K.: *See—*
Hirozawa, Stanley T.; and Langdon, William K., 3,971,706.

Lapikas, Thomas S.: *See—*
Mowatt-Larssen, Erling; and Lapikas, Thomas S., 3,971,491.

LaPorte, Jean-Claude: *See—*
LaPorte, Jean-Michel; and LaPorte, Jean-Claude, 3,971,357.

LaPorte, Jean-Michel; and LaPorte, Jean-Claude. Method and apparatus for throwing frangible targets. 3,971,357, Cl. 124-8.000.

Lappin, Gerald Ray: *See—*
Zannucci, Joseph Salvatore; and Lappin, Gerald Ray, 3,971,755.

Larson, Lawrence L.: *See—*
Ruger, William B.; and Larson, Lawrence L., 3,971,150.

Larson, Richard Ralph, to Hercules Incorporated. Thermally actuated percussion initiatable explosive cartridge assembly. 3,971,319, Cl. 102-24.00R.

Larsson, Tore I.: *See—*
Soukup, Franz; Rosberg, Bengt A.; Larsson, Tore I.; and Brunlid, John-Erik, 3,971,192.

Lavis, Stanley, to Phelps Time Recording Lock Corporation. Lock. 3,971,239, Cl. 70-134.000.

Lawrence Peska Associates, Inc.: *See—*
Cvitkovich, Mary, 3,971,304.

LeBoeuf, Albert R., to American Optical Corporation. Process for the production of an abrasion resistant optical element. 3,971,872, Cl. 428-412.000.

LeBrun, Michel A., Jr.: *See—*
McRoskey, John W.; Swartz, Delbert D.; and LeBrun, Michel A., Jr., 3,971,488.

Lecayon, Gerard: *See—*
Duperray, Gerard; Eyraud, Charles; Lecayon, Gerard; and Lenoir, Janine, 3,971,671.

Lee, Chi-Long; and Marko, Ollie W., to Dow Corning Corporation. Method of preparing olefinic siloxane by GLC. 3,971,818, Cl. 260-448.20E.

Lee Company, The: *See—*
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Meeks, Lawrence A.; and Biggs, James W., to National Distillers and Chemical Corporation. Ethylene-vinyl acetate silicone rubber adherent laminates and method of production. 3,971,884, Cl. 174-120.0SR.
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shino, Mitsuyuki; Yoshino, Sadafumi; and Mikuma, Katsunori, 3,971,820.
Miles, Leon H.: *See—*
Knowles, Charles R.; Miles, Leon H.; and Bell, Larry N., 3,971,441.
Millar, James S.; and Garrett, Douglas R., to Parker-Hannifin Corporation. Pressure controlled hydrant valve coupler. 3,971,405, Cl. 137-489 000.
Miller, Frederick L. B., to Mainland Industries, Inc. Log feeder for canting machine. 3,971,423, Cl. 144-176.000.
Miller, Jaydee W., to Pyromet, Inc. Process for removing sulfur impurities from a fluid by contact with silver articles. 3,971,712, Cl. 208-208.00R.
Miller, Wendell E., to Scott & Fetzer Company, The. Load responsive system with synthetic signal. 3,971,216, Cl. 60-445.000.
Miner Enterprises, Inc.: *See—*
Kendall, Giles A.; and Wallace, William D., 3,971,551.
Minerec Corporation: *See—*
Strow, Lawrence Evans; and Bolth, Franklin Anderson, 3,971,836.
Minford, James Dean: *See—*
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Minnesota Mining and Manufacturing Company: *See—*
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Carlson, Robert C.; and Stoskopf, Albert H., 3,971,745.
Johnson, Erlin J., 3,971,866.
Taylor, Allen L., 3,971,250.
Minolta Camera Kabushiki Kaisha: *See—*
Matsuda, Motonobu; Beppu, Norio; and Ueda, Hiroshi, 3,972,055.
Tsujimoto, Kayoshi; Matsui, Tohru; Abe, Haruo; and Horimoto, Mitsuaki, 3,972,056.
Mita, Itaru; Okumura, Shigeo; Yamabe, Shigeru; Funae, Yoshihiko; and Matumoto, Junzo, to Santen Pharmaceutical Co. Ltd. N-(mercaptoacyl)aminoacids. 3,971,828, Cl. 260-534.00S.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Kimura, Yoshio; Mitsuoka, Hiroshi; and Hosono, Isamu, 3,972,063.
Kinase, Takeo; Yano, Isamu; Okubo, Kanichi; Kitakoga, Hidetoshi; and Tayama, Hiromitsu, 3,971,220.
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Mitsubishi Gas Chemical Company, Inc.: *See—*
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Mitsubishi Petrochemical Company Limited: *See—*
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Mitsui Construction Co., Ltd.: *See—*
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Chibata, Ichiro; Miyoshi, Munetugu; Ito, Hiroshi; Fujii, Toshiyuki; and Kawashima, Keisuke, 3,971,822.
Model, Ernst, to Ciba-Geigy Corporation. Iminoisoindolinone pigments and process for their manufacture. 3,971,805, Cl. 260-325.0PH.
Mojden, Wallace W.; Davila, Jose E.; Hooper, George W.; Kwiatkowski, Gerald M.; and Pantel, Howard W., Jr., to Fleetwood Systems, Inc. Apparatus for counting and packaging can ends. 3,971,189, Cl. 53-63.000.
Molzer, Peter: *See—*
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Molzon, William R., to Rohr Industries, Inc. Double deck bus. 3,971,455, Cl. 180-89.00R.
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Hamisch, Paul H., Sr., 3,971,497.
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Montgomery, Gary Van, to Sunbeam Plastics Corporation. Threaded cap and neck for a liquid container. 3,971,487, Cl. 215-216.000.
Montgomery, Tom C. Variable magnetic lock. 3,971,581, Cl. 292-251.500.
Montjallard, Paul Rene Marius: *See—*
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Moore, Warren, Jr.: *See—*
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Moore & White Company, The: *See—*
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Moosburger, Hans: *See—*
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Morelli, Alberto. Aerodynamic device for improving the high speed running conditions of motorcycles. 3,971,452, Cl. 180-1.0FV.
Moreno, Roland, to Societe Internationale. Methods of data storage and data storage systems. 3,971,916, Cl. 235-61.70B.
Morgan, Veldon. Separable double ply saddle pad. 3,971,194, Cl. 54-66.000.
Mori, Hisashi: *See—*
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Morita, Minoru, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method of and an apparatus for purifying exhaust gases of an internal combustion engine. 3,971,212, Cl. 60-290.000.
Morley Furniture Spring Corporation: *See—*
Crosby, Lawton H.; and Keane, Thomas H., 3,971,082.
Morokawa, Shigeru: *See—*
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Morrell, Roger J., to United States of America, Interior. Prestressed roof support system. 3,971,226, Cl. 61-45.00B.
Morris, Donald E.: *See—*
Wenninger, Freddie W.; Morris, Donald E.; Kohoutek, Jindrich; Maitland, David S.; Clifford, Douglas M.; Schulte, Louis T.; and Keith, John C., 3,971,925.
Morse, Theodore Frederick. Centrifugal separator. 3,971,510, Cl. 233-27.000.
Morton-Norwich Products, Inc.: *See—*
Pelosi, Stanford S., Jr., 3,971,811.
Schwan, Thomas J., 3,971,788.
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Motley, David M.; and Cheng, King Y., to Hycom Incorporated. Phase tracking network. 3,971,996, Cl. 328-155.000.
Motorola, Inc.: *See—*
Bara, Edwin Stanley, 3,972,073.
Bilsens, Gunars; and Figueroa, Raymond Oscar, 3,971,999.
Fukayama, Gary P.; and Repay, Laszlo N., 3,972,070.
Gemmell, Frank S.; and Fried, Mark A., 3,971,317.
Hopp, Gene P., 3,972,062.
Johnson, Robert H., 3,972,042.
Means, Rodney J.; and Schriber, Gene A., 3,971,960.
Petri, Chris A., 3,972,001.
Motoyama, Hiroshi. Apparatus and method for measuring the condition of the meridians and the corresponding internal organs of the living body. 3,971,366, Cl. 128-2.10Z.
Mount, Wadsworth W. Lock nut. 3,971,085, Cl. 10-86.00A.
Mourier, Emile, to Rhone-Poulenc S.A. Process for the semihydrogenation of citral to citronellal. 3,971,831, Cl. 260-601.00R.
Mowatt-Larssen, Erling; and Lapikas, Thomas S., to General American Transportation Corporation. Intermodal tank container. 3,971,491, Cl. 220-71.000.
Multi Tech Electronics, Inc.: *See—*
McGlamery, Merrill H., Sr., 3,971,617.
Multifastener Corporation: *See—*
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Mulvey, Dennis M.: *See—*
Shen, Tsung-Ying; Jones, Howard; Mulvey, Dennis M.; and Dorn, Conrad P., 3,971,797.
Murai, Ryukichi, to Yoshida Kogyo Kabushiki Kaisha. Fabric tape for slide fastener stringers with means to prevent unraveling at its severed ends. 3,971,868, Cl. 428-194.000.
Murakami, Masahiro: *See—*
Norita, Toshimasa; Ibara, Hisato; Murakami, Masahiro; and Okano, Masao, 3,971,705.
Murakami, Masao; Amaya, Akio; and Kawakita, Masaru, to Sony Corporation. Adhesive resin composition. 3,971,865, Cl. 428-40.000.
Murakami, Noboru; Matsuo, Koichi; Hirosawa, Koichiro; and Ohara, Kazuo, to Aisin Seiki Kabushiki Kaisha. Speed change gear system. 3,971,267, Cl. 74-759.000.
Murakami, Noboru; Hirosawa, Koichiro; Matsuo, Koichi; and Ohara, Kazuo, to Aisin Seiki Kabushiki Kaisha. Speed change gear system. 3,971,268, Cl. 74-759.000.
Murakami, Shoichi: *See—*
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Murakami, Tomomi; Nagata, Hiromichi; Funazawa, Masakazu; and Fukutome, Satoru, to Citizen Watch Co., Ltd. Packing means for a watch. 3,971,207, Cl. 58-152.00B.
Murata Kikai Kabushiki Kaisha: *See—*
Shimai, Junichiro, 3,971,520.
Murdoch, Henry W.; and Schumacher, Percy W., Jr., to Reed Tool Company. Drill bit. 3,971,600, Cl. 308-8.200.
Murvall, Ake Eugen, to ABU Aktiebolag. Fishing reel. 3,971,530, Cl. 242-217.000.
Mushabac, David R. Dental restoration. 3,971,133, Cl. 32-2.000.
Muto, Steve Yoneo, to Hewlett-Packard Company. Etching thin film circuits and semiconductor chips. 3,971,684, Cl. 156-13.000.
Myers, Robert M.; Dunkelberger, David L.; and Carty, Daniel T., to Rohm and Haas Company. Vinyl halide polymer impact modifiers. 3,971,835, Cl. 260-876.00R.
Myklebust, Paal, to Gerber Products Company. Non-splitting electric room vaporizer. 3,971,913, Cl. 219-284.000.
Nagata, Hiromichi: *See—*
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Nagel, Suzanne Rose: *See—*
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Naiman, Charles S.; Chicklis, E. P.; and Linz, Arthur, to Sanders Associates, Inc. Laser. 3,972,007, Cl. 331-94.50F.
Nakagome, Yukio; Watanabe, Teruji; Fukui, Takasuke; and Suzuki, Shizuo, to Kokusai Denshin Denwa Kabushiki Kaisha. Magnetism detecting system. 3,971,981, Cl. 324-43.00R.
Nakamura, Heiichiro: *See—*
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Nakamura, Kanichi: *See—*
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Nakano, Yoshiki; Nakamura, Heiichiro; Fujita, Tatsuo; Nakamura, Kanichi; and Higo, Masaaki, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Water lubricated bearing device. 3,971,606, Cl. 308-238.000.
Nakano, Yoshinori, to Nippondenso Co., Ltd.; and Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Rheostatic control system for a DC motor. 3,971,973, Cl. 318-251.000.
Nakazawa, Yoshiyuki; Nakamura, Yasuharu; Sueyoshi, Tohru; and Sato, Akira, to Fuji Photo Film Co., Ltd. Fine grain silver halide emulsions with polyheteronuclear sensitizing dyes. 3,971,664, Cl. 96-127.000.
Napper, Jack C. Method for extracting a mounted anchor bolt and anchor bolt extractor therefor. 3,971,121, Cl. 29-427.000.
Naremco, Inc.: *See—*
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Nash, Alan Richard Brine. Control means. 3,971,295, Cl. 91-386.000.
National Carpet Jobbers: *See—*
Anderson, Lloyd E.; and Alinder, Gilbert L., 3,971,484.
National Distillers and Chemical Corporation: *See—*
Meeks, Lawrence A.; and Biggs, James W., 3,971,883.
Meeks, Lawrence A.; and Biggs, James W., 3,971,884.
National Forge Company: *See—*
Witkin, Donald E.; and Bowles, Arnold G., 3,971,876.
National Research Development Corporation: *See—*
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National Semiconductor Corporation: *See—*
Nelson, Carl T., 3,972,061.
Navratil, Franz, to Siemens Aktiengesellschaft. Arrangement for rapid switching of a high frequency magnetic field. 3,972,036, Cl. 340-174.0TF.
NCR Corporation: *See—*
Peck, Wayne P., 3,971,435.
Nelligan, William B., to Schlumberger Technology Corporation. Two detector pulsed neutron porosity and water salinity apparatus and methods. 3,971,935, Cl. 250-262.000.
Nelson, Bror H.: *See—*
Harris, John L.; and Nelson, Bror H., 3,971,469.
Nelson, Carl T., to National Semiconductor Corporation. Monolithic lateral S.C.R. having reduced "on" resistance. 3,972,061, Cl. 357-38.000.
Nelson, Martin N.: *See—*
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Neuco Apparatebau AG: *See—*
Schnyder, Conrad W., 3,971,607.
Nevins, John E., Jr.; and Winslow, Lester M., to Varian Associates. Ultrawide band traveling wave tube amplifier employing axially conductive circuit loading members. 3,972,005, Cl. 330-43.000.
Newman, Larry B.; and Demuth, John W., to Eastman Kodak Company. Transfer tail apparatus for use with textile yarn winders. 3,971,518, Cl. 242-18.0PW.
Nienberg, Raymond Frank. Agricultural do-all machine. 3,971,446, Cl. 172-311.000.
Nihon Electronic Industry Co. Ltd.: *See—*
Saito, Minoru, 3,971,918.
Nilsson, Elving: *See—*
Sterner, Erik; and Nilsson, Elving, 3,971,339.
Nilsson, Karl Erik; and van Riesen, Reiner. Belt locking arrangement for a passive belt system for automobiles. 3,971,570, Cl. 280-746.000.
Nimco Corporation: *See—*
Bachner, George L., 3,971,300.
Nininger, John H., III: *See—*
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Nippon Kogaku K.K.: *See—*
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Shio, Megumu, 3,971,599.
Nippon Kokan Kabushiki Kaisha: *See—*
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Nippon Oils and Fats Company Limited: *See—*
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Nippon Soda Company Limited: *See—*
Kobayashi, Tatsumi; Nishiwaki, Eiji; Yamazoe, Shigeharu; Hoshino, Mitsuyuki; Yoshino, Sadafumi; and Mikuma, Katsunori, 3,971,820.
Nippon Steel Corporation: *See—*
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Nippondenso Co., Ltd.: *See—*
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Nakano, Yoshinori, 3,971,973.
Nishimura, Hideo; and Otsu, Ikuo, to Toyoda Koki Kabushiki Kaisha. Control apparatus for a machine tool. 3,971,168, Cl. 51-165.800.
Nishiwaki, Eiji: *See—*
Kobayashi, Tatsumi; Nishiwaki, Eiji; Yamazoe, Shigeharu; Hoshino, Mitsuyuki; Yoshino, Sadafumi; and Mikuma, Katsunori, 3,971,820.
Niskin, Shale J. Dynamically balanced apparatus for water borne instruments. 3,971,251, Cl. 73-170.00A.
Nissan Chemical Industries, Ltd.: *See—*
Suzuki, Keiki; Yoshida, Akitoshi; and Inoue, Shigeki, 3,971,665.
Nissan Denshi Company Limited: *See—*
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Nissan Motor Company Limited: *See—*
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Nitto Boseki Co.: *See—*
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NL Industries, Inc.: *See—*
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Nobbs, Arthur Joseph: *See—*
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Nomura, Yasushi; and Morokawa, Shigeru, to Citizen Watch Co., Ltd. All electronic-type timepiece. 3,971,205, Cl. 58-50.00R.
Norberg, Carl Eric Bertil. Method and apparatus for indicating a load placed on a load-carrying vehicle platform. 3,971,451, Cl. 177-1.000.
Norberg, Lars-Gunnar: *See—*
Folgero, Kare; Norberg, Lars-Gunnar; and Oberg, Karl-Erik, 3,971,548.
Nordson Corporation: *See—*
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Norita, Toshimasa; Ibara, Hisato; Murakami, Masahiro; and Okano, Masao, to Sanyo-Kokusaku Pulp Co., Ltd. Method of producing char from pulp manufacturing waste liquor. 3,971,705, Cl. 201-2.500.
Northrop Corporation: *See—*
Locus, Silvan Stanley, 3,972,043.
Northrup, King & Co.: *See—*
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NRM Corporation: *See—*
Gazuit, Georges, 3,971,694.
Nudelman, Abraham, to American Home Products Corporation. 7-[2-(5-Amino-1,3,4-thiadiazol-2-ylthio)acetamido]cephalosporins. 3,971,779, Cl. 260-243.00C.
Nudinger, Gunter; Collin, Heinrich; and Moosburger, Hans, to Bayerische Berg-, Hutten- und Salzwerke AG. Device for connecting an expiring first web of a web-shaped material with the beginning of a second web of a web shaped material. 3,971,524, Cl. 242-58.400.
Nufer, Hans L.: *See—*
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Nulph, Robert J.: *See—*
Anderson, Arnold L.; and Nulph, Robert J., 3,971,758.
Numata, Yukio: *See—*
Saikaishi, Noboru; Yamada, Tsuneo; Takahashi, Tetsuo; and Numata, Yukio, 3,971,992.
Nylund, Roger; and Holmala, Aulis, to Oy Tampella AB. Procedure for controlling a rock drill and rock drill for carrying out the procedure. 3,971,449, Cl. 175-27.000.
Obayashi, Nobuharu; and Sakashita, Tetsuzi, to Kabushiki Kaisha Kawai Gakki Seisakusho. Electronic musical instrument capable of transposition. 3,971,282, Cl. 84-1.010.
Oberg, Karl-Erik: *See—*
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Fredrikson, Bengt; and Oberg, Karl-Erik, 3,971,547.
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Murakami, Noboru; Hirosawa, Koichiro; Matsuo, Koichi; and Ohara, Kazuo, 3,971,268.
O'Hare, Louis Richard. Method of generating electricity from radiant energy called variable polarizability capacity generator. 3,971,938, Cl. 250-336.000.
Ohe, Osamu: *See—*
Ohsawa, Akira; Yamazaki, Ryosuke; Ohe, Osamu; and Okamura, Ryoji, 3,971,709.

Ohkubo, Hachiro. Container. 3,971,505, Cl. 229-45.00R.

Ohl, Wolf; and Ball, Herbert, to International Standard Electric Corporation. Circuit arrangement for a selective signal receiver, particularly for use in telephone systems. 3,971,897, Cl. 179-84.0VF.

Ohsawa, Akira; Yamazaki, Ryosuke; Ohe, Osamu; and Okamura, Ryoji, to Nippon Oils and Fats Company Limited. Method for forming smooth cured coated films. 3,971,709, Cl. 204-181.000.

Ohta, Takeo; and Takenaga, Mutsuo, to Matsushita Electric Industrial Co., Ltd. Optical information storage material and method of making it. 3,971,874, Cl. 428-432.000.

Okamura, Ryoji: *See—*
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Okano, Masao: *See—*
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Okonite Company, The: *See—*
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Okubo, Kanichi: *See—*
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Okumura, Shigeo: *See—*
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Okumura, Shuji: *See—*
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Olin, Irwin D.: *See—*
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Olsen, Charles R. Pressure actuated tube primer. 3,971,322, Cl. 102-86.500.

Olsson, Erik Allan, to Olsson International Inc. Process of solidifying molten metal. 3,971,123, Cl. 29-527.700.

Olsson International Inc.: *See—*
Olsson, Erik Allan, 3,971,123.

Olympia Werke AG: *See—*
Weber, Gerald; and Sorgenfrei, Jurgen, 3,972,028.

Olympus Optical Co., Ltd.: *See—*
Yoshinaga, Makoto, 3,971,622.

O'Neal, Cothburn M.; Mayo, Alfred M.; and Childs, George William, deceased (by Childs, Patricia M., executrix), to Riverside Press, Inc. Voting machine. 3,971,914, Cl. 235-54.00R.

O'Neil, Robert, to Beneke Division, Beatrice Foods Co. Adjustable height closet seat assembly. 3,971,077, Cl. 4-239.000.

Ono, Kazuyoshi; Suzuki, Osamu; and Hidaka, Hideo, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Safety device for stopping the bale plucking operation. 3,971,103, Cl. 19-.200.

Ono, Tomoyoshi; and Matsuguma, Yoshihiko, to Teijin Limited. Pressure-sensitive adhesive and pressure-sensitive adhesive tape or drape. 3,971,766, Cl. 526-317.000.

Ono, Tsuyoshi: *See—*
Inami, Mamoru; Tanaka, Yoshiaki; and Ono, Tsuyoshi, 3,971,961.

Onoda, Hajime, to Kimmon Manufacturing Co., Ltd. Electronic integration calorimeter. 3,971,252, Cl. 73-193.00R.

Onogi, Kenji: *See—*
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Optical Coating Laboratory, Inc.: *See—*
Gelber, Robert M.; and Small, Edward A., Jr., 3,971,869.

Ortheil, Hans, deceased (by Ortheil, Hildegard M., administratrix), to Kane and Company. Basic dyeing. 3,971,625, Cl. 8-82.000.

Ortheil, Hildegard M., administratrix: *See—*
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Ortho Pharmaceutical Corporation: *See—*
Krantz, Kermit E., 3,971,378.

Osborne, Irving R. Apparatus for cleaning vehicle parts. 3,971,394, Cl. 134-104.000.

Osiadacz, William J., to Baxter Laboratories, Inc. Automated meat tenderization system. 3,971,088, Cl. 17-25.000.

Osterhout, Richard E.; McCray, Walter A.; and Rudowicz, Mark J., to Hilti Aktiengesellschaft. Method of repairing ingot mold bottoms. 3,971,117, Cl. 29-401.00E.

Oswdek Badawczo-Rozwojowy Przemyslu Budowy Chemicznych Cebea: *See—*
Kulig, Stanislaw, 3,971,298.

Otani, Syuichi: *See—*
Abe, Fumiyuki; and Otani, Syuichi, 3,971,569.

Otsu, Ikuo: *See—*
Nishimura, Hideo; and Otsu, Ikuo, 3,971,168.

Otto, Friedrich, to A. Stephan u. Sohne. Method of making liverwurst. 3,971,851, Cl. 426-646.000.

Otto, George W., Jr.: *See—*
Craig, James R.; and Otto, George W., Jr., 3,971,946.

Otto, Peter H.: *See—*
Winkle, Gunther; Schwarzler, Peter; Otto, Peter H.; Molzer, Peter; and Walkner, Christian, 3,971,537.

Owens-Corning Fiberglas Corporation: *See—*
Allen, Richard W.; Bond, Raymond E.; and Saba, Richard T., 3,971,336.
Foley, Kevin M.; Bell, Reuben H.; and McCombs, Frank P., 3,971,750.
Haynes, Harold L.; and Harvey, Michael J., 3,971,871.
Kowalski, Carl D.; Finn, Lawrence R.; and Yawberg, Richard C., 3,971,277.

Owens-Illinois, Inc.: *See—*
Ludder, Rodney E., 3,971,471.

Oy Tampella AB: *See—*
Nylund, Roger; and Holmala, Aulis, 3,971,449.

Ozawa, Masayoshi; Machida, Minoru; Kawabata, Yoichi; and Seki, Mitsuaki, to Canon Kabushiki Kaisha. Electronic calculator displaying a partial result obtained from a portion of a numerical expression. 3,971,924, Cl. 235-156.000.

P. R. Mallory & Co., Inc.: *See—*
Voyles, Gerald A.; and Moss, Edward M., 3,971,970.

Packard, Norman M.; and Gaines, John W., to International Harvester Company. Ring manufacture, productive of face contact seal. 3,971,165, Cl. 51-131.000.

Padleckas, Henry; and Wenzlow, Ludwig. Interlocking clips and rafters for roof panels. 3,971,183, Cl. 52-478.000.

Padnes, David Richard: *See—*
Giguere, Winfield Joseph; and Padnes, David Richard, 3,971,127.

Padrutt, Paul W.: *See—*
Baron, George B.; and Padrutt, Paul W., 3,971,215.

Panduit Corporation: *See—*
Caveney, Jack E., 3,971,105.

Paniagua, Juan Garcia. Projector of fluid with electric charge, of portable type. 3,971,292, Cl. 89-1.00A.

Panoduz-Anstalt Co.: *See—*
Privas, Yves Emile, 3,971,229.

Panosh, James L., to Alpha Nova Development Corporation. Fluorescent table tennis assembly. 3,971,560, Cl. 273-30.000.

Panta AG: *See—*
Brugger-Stuker, Ruth, 3,971,144.

Pantel, Howard W., Jr.: *See—*
Mojden, Wallace W.; Davila, Jose E.; Hooper, George W.; Kwiatkowski, Gerald M.; and Pantel, Howard W., Jr., 3,971,189.

Paoli, Alfred; and Shah, Bipin J., to Akzona Incorporated. Electrical connector with means for maintaining a connected condition. 3,971,614, Cl. 339-89.00R.

Parker, Darrell G. Portable smokehouse. 3,971,308, Cl. 99-467.000.

Parker-Hannifin Corporation: *See—*
Millar, James S.; and Garrett, Douglas R., 3,971,405.

Parker Sangyo Co., Ltd.: *See—*
Goto, Issei; and Hara, Suzo, 3,971,539.

Parsson, Nils Owe, to Saab-Scania Aktiebolag. Operating device for locking mechanisms in doors, hatches and the like. 3,971,241, Cl. 70-275.000.

Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Shtanko, Jury Pavlovich; Tsukanov, Georgy Emmanuilovich; Bogachenko, Alexei Georgievich; Bondarenko, Oleg Petrovich; Martyn, Viktor Mikhailovich; Baglai, Vitaly Mikhailovich; Stupak, Leonid Mikhailovich; Artamonov, Viktor Leonidovich; and Pavliichuk, Georgy Anatolievich. Furnace for electroslag remelting of consumable electrodes. 3,971,430, Cl. 164-252.000.

Patrick, William D.: *See—*
Helms, Charles R.; and Patrick, William D., 3,971,468.

Patton, Jon Richard; and Sisson, Ronald Loren, to Clark Equipment Company. Hydrostatic control - pivot steering. 3,971,453, Cl. 180-6.480.

Paul, Bernt: *See—*
Hini, Paul; and Paul, Bernt, 3,971,253.

Pavliichuk, Georgy Anatolievich: *See—*
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Shtanko, Jury Pavlovich; Tsukanov, Georgy Emmanuilovich; Bogachenko, Alexei Georgievich; Bondarenko, Oleg Petrovich; Martyn, Viktor Mikhailovich; Baglai, Vitaly Mikhailovich; Stupak, Leonid Mikhailovich; Artamonov, Viktor Leonidovich; and Pavliichuk, Georgy Anatolievich, 3,971,430.

Pearson, Arthur David: *See—*
Bachmann, Klaus Jurgen; Nagel, Suzanne Rose; Pearson, Arthur David; Schmidt, Paul Herman; and Tynes, Arthur Richard, 3,971,645.

Pearson, Bangt R.: *See—*
Tardiff, Armand L.; Broughton, Glover F.; Delorey, David R.; and Pearson, Bangt R., 3,971,193.

Peavey Company: *See—*
Huessy, Eric G., 3,971,859.

Peberdy, John Malcolm: *See—*
Wolff, Paul Heinz Walter; and Peberdy, John Malcolm, 3,971,698.

Peck, Wayne P., to NCR Corporation. Heat transfer device. 3,971,435, Cl. 165-78.000.

Pedersen, Ib Obel. Process and apparatus for joining objects together. 3,971,693, Cl. 156-273.000.

Pehoushek, Joseph W.: *See—*
Riemenschneider, Don H.; Townsend, William L.; and Pehoushek, Joseph W., 3,972,031.

Pelosi, Stanford S., Jr., to Morton-Norwich Products, Inc. 5-(4-Chlorophenyl)-2-furyl phenyl ketone. 3,971,811, Cl. 260-347.800.

Penman, Alistair: *See—*
Collier, Peter Dudley; Penman, Alistair; and Trussell, Frederick John, 3,971,858.

Pennwalt Corporation: *See—*
Jurecic, Anton, 3,971,754.

Penrice, Peter John: *See—*
Mason, John Jefferson; and Penrice, Peter John, 3,971,677.

Peppler, William S., to Diamond International Corporation. Method for producing deckle-free edges and windows in molded fiber products. 3,971,689, Cl. 162-226.000.

Peren, Karl Gunnar Magnus; and Svensson, Stig Ake Gosta, to AB Profila. Automatic apparatuses, robots and the like. 3,971,091, Cl. 15-49.00R.

Perez, Manuel, to Aerosols Control Corporation. Gas scrubber. 3,971,642, Cl. 55-223.000.

Perret, Ludwig A., to Bell & Howell Company. Aircraft with television system. 3,972,045, Cl. 343-705.000.

Personal Products Company: *See—*
Chatterjee, Pronoy Kumar, 3,971,379.

Persson, Bengt Arne, to B A Installationsutveckling AB. Sillcock. 3,971,401, Cl. 137-360.000.

Peter, Richard: *See—*
Angliker, Hans-Joerg; and Peter, Richard, 3,971,771.

Peters, Beldon A., to Exxon Production Research Company. Three-phase separator. 3,971,719, Cl. 210-104.000.

Peters, David L., to Singer Company, The. Color video synthesizer with monochrome input. 3,972,067, Cl. 358-81.000.

Peters, Edwin F.; Spangler, Michael J.; Michaels, Glenn O.; and Jezl, James L., to Standard Oil Company (Indiana). Vapor phase reactor off-gas recycle system for use in the vapor state polymerization of monomers. 3,971,768, Cl. 526-68.000.

Peters, Leo; Dymit, Joseph M.; Lilley, James C.; Smith, Donald R.; and Warners, Henry, to Peters, Leo. Meat slicing board. 3,971,273, Cl. 83-42.000.

Peterson, C. Robert. Rollable sheet having target aperture and missile used therewith. 3,971,562, Cl. 273-95.00R.

Peterson, Warren J., to Joerns Furniture Company. Side guard for beds. 3,971,083, Cl. 5-331.000.

Peterson, William A., Jr.: *See—*
Luchaco, David G.; and Peterson, William A., Jr., 3,971,354.

Petri, Chris A., to Motorola, Inc. Common mode rejection dynamic filter circuit. 3,972,001, Cl. 330-22.000.

Petrie, Robert D.; Wensley, Thomas E.; Watkins, Charles; and Gaminde, Juan. Combination book end and dumbell apparatus and method of utilizing same. 3,971,556, Cl. 272-122.000.

Pfarrwaller, Erwin, to Sulzer Brothers Limited. Apparatus for storage of filamentary material. 3,971,522, Cl. 242-47.010.

Pfeiler, Manfred; and Linke, Gerhard, to Siemens Aktiengesellschaft. X-ray diagnostic apparatus for producing a transverse layer image. 3,971,948, Cl. 250-445.00T.

Pfizer Inc.: *See—*
Barnish, Ian Thompson; Cox, David Alexander; and Evans, Anthony Garth, 3,971,783.
Hess, Hans-Jurgen E.; Johnson, Michael R.; Bindra, Jasjit S.; and Schaaf, Thomas K., 3,971,826.
Lombardino, Joseph G., 3,971,802.

Pfleiderer, Wolfgang: *See—*
Zondler, Helmut; and Pfleiderer, Wolfgang, 3,971,792.

Phelps Time Recording Lock Corporation: *See—*
Lavis, Stanley, 3,971,239.

Phillips Petroleum Company: *See—*
Hessert, James E.; and Clampitt, Richard L., 3,971,440.
Reusser, Robert E., 3,971,810.

Piber, Earl T., to Cutler-Hammer, Inc. Snap-in arrangement for mounting devices in a support panel aperture. 3,971,908, Cl. 200-296.000.

Picciolo, Grace L.; and Chappelle, Emmett W., to United States of America, National Aeronautics and Space Administration. Method of detecting and counting bacteria. 3,971,703, Cl. 195-103.50R.

Pickard, John; Melling, Richard; and Nobbs, Arthur Joseph, to Triplex Safety Glass Company Limited. Formation of laminated glass articles. 3,971,668, Cl. 156-104.000.

Picker X-Ray Mfg. Limited: *See—*
Bridgeman, Cecil K., 3,971,953.

Pietruska, Joachim: *See—*
Kruger, Wilm; Schatka, Gunther; and Pietruska, Joachim, 3,971,912.

Pilkington Brothers Limited: *See—*
Rhodes, William Jackson, 3,971,646.

Pitzele, Barnett S.: *See—*
Baran, John S.; and Pitzele, Barnett S., 3,971,827.

Plessey Handel und Investments AG: *See—*
Hollis, John Edward; and Barrett, John Albert, 3,971,895.

Polak's Frutal Works, Inc.: *See—*
Brenner, Joseph; Henderson, Gary H.; and Bergensten, Robert W., 3,971,852.

Polaroid Corporation: *See—*
Johnson, Bruce K.; and Whiteside, George D., 3,972,058.
Rubinstein, Leon, 3,971,841.
Whiteside, George D., 3,972,057.
Wilson, Stewart W., 3,971,141.

Polymer Processing Research Institute Ltd.: *See—*
Yazawa, Masahide, 3,971,838.

Ponemone, Seymour J.: *See—*
Lindberg, Frank A.; Konsowski, Stephen G.; Shamash, Maurice B.; and Ponemone, Seymour J., 3,971,661.

Pope, Jack M.; and Fryer, Thomas B., to United States of America, National Aeronautics and Space Administration. Miniature ingestible telemeter devices to measure deep-body temperature. 3,971,362, Cl. 128-2.00P.

Porelon, Inc.: *See—*
Hansen, Frederick C., 3,971,315.

Porret, Daniel; Habermeier, Jurgen; and Baumann, Dieter, to Ciba-Geigy Corporation. Glycidyl compounds containing phosphorus. 3,971,813, Cl. 260-309.500.

Porte, Robert; and Rommens, Michel, to Commissariat a l'Energie Atomique. Method of extraction of nodular sediments or the like from the sea floor and an installation for carrying. 3,971,593, Cl. 299-8.000.

Pourrias, Bernard M.: *See—*
Fauran, Claude P.; Eberle, Jeannine A.; Bourgery, Guy R.; Raynaud, Guy M.; and Pourrias, Bernard M., 3,971,793.

Power, John J.: *See—*
Wines, Harry T.; Power, John J.; and Knauer, Gilbert, 3,971,969.

PPG Industries, Inc.: *See—*
Beestrice, William R.; Cherenko, Joseph; and Frey, William I., 3,971,864.
Mazzoni, Renato J.; Bowser, George H.; and Lewchuk, Richard R., 3,971,178.

Prasad, Raj Nandan; and Garmaise, David Lyon, to Abbott Laboratories. 1,N^6-etheno-5'-adenosine carboxylates for increasing coronary sinus partial pressure of oxygen. 3,971,849, Cl. 424-180.000.

Price, Herbert T., to Reynolds Metals Company. Method of producing high brightness corrosion resistant finish on the surface of aluminum and its alloys. 3,971,873, Cl. 428-463.000.

Prince, Paul O., to United States of America, Army. Holding device for measuring the capacity of small electrical components. 3,971,618, Cl. 339-143.00R.

Privas, Yves Emile, to Panoduz-Anstalt Co. Apparatus for producing cold principally for the application of cold by contact on the body of living beings. 3,971,229, Cl. 62-3.000.

Procter & Gamble Company, The: *See—*
Sagel, John A.; and Weber, Clarence Edward, 3,971,815.

Proctor, Ellen M.: *See—*
Evans, David T.; Proctor, Ellen M.; Brion, Frank R.; and Ceelen, Theodorus M., 3,971,950.

Professional Surgical Manufacturing Company: *See—*
Gibson, Robert T., 3,971,381.

Properzi, Giulio. Cooling device for the wheel of a continuous casting machine. 3,971,431, Cl. 164-278.000.

Pundsack, Arnold L., to Xerox Corporation. Coating device. 3,971,334, Cl. 118-5.000.

Puritan Equipment, Inc.: *See—*
Forbes, Robert Stafford; Herrick, Gary Dean; and Richter, Robert Julius, 3,971,368.

Pusey, Peter Nicholas: *See—*
Jakeman, Eric; and Pusey, Peter Nicholas, 3,971,956.

Pyromet, Inc.: *See—*
Miller, Jaydee W., 3,971,712.

Quaker Oats Company, The: *See—*
Buix, Louis F.; Gribnitz, Harry J.; and Hohner, Gary A., 3,971,629.

Quarmby, Robert C.: *See—*
Gadd, Ronald O. C.; Quarmby, Robert C.; and Smith, Frank R., 3,971,089.

Quarve, Vernon Kenneth, to Graco Inc. Hydraulic runaway control valve. 3,971,404, Cl. 137-462.000.

Querfurth, William M.; Schwartz, Michael A.; and Wiltberger, Jon C., to Burgess Vibrocrafters, Inc. Electric grass sickle-shear. 3,971,130, Cl. 30-220.000.

Quinby, Thomas C., to United States of America, Energy Research and Development Administration. Neutron dosimetry. 3,971,944, Cl. 250-391.000.

Radford, Colin-Michael. Filter elements. 3,971,722, Cl. 210-486.000.

Raffinerie Tirlemontoise: *See—*
Blaude, Joseph Emile Albert; and Duchateau, Georges Francois Michel Frederic, 3,971,667.

Rainer, Georg: *See—*
Sommer, Richard; Rainer, Georg; and Wolfrum, Gerhard, 3,971,770.

Rains, William A.; Fox, Robert D.; and Flynn, James P., to Dow Chemical Company, The. Composite double base propellant with triaminoguanidinium azide. 3,971,681, Cl. 149-19.800.

Rallapalli, Krishna: *See—*
Derickson, Richard B., III; and Rallapalli, Krishna, 3,972,034.

Ramanathan, Visvanathan: *See—*
Desai, Nalin Binduprasad; Jayaraman, Ponnusami; Ramanathan, Visvanathan; Artz, Klaus; Naik, Navnitrai Nagarji; and Jenny, Walter, 3,971,740.

Ramot University Authority for Applied Research and Industrial Development Ltd.: *See—*
Seidman, Ady; Avrahami, Zohar; Sheinfux, Benjamin; Grinberg, Jan; and Shimoni, Uri, 3,971,942.

Randall, Robert L. Decorative acoustical building panel. 3,971,867, Cl. 428-4[illegible].000.

Ranken, William A.; and Kemme, Joseph E., to United States of America, Energy Research and Development Administration. Heat pipe methanator. 3,971,634, Cl. 48-120.000.

Rannels, Lynn Lee. Stud-truss and method of making same. 3,971,176, Cl. 52-86.000.

Rasberger, Michael, to Ciba-Geigy Corporation. 3-Alkyl-4-oxo-imidazolidines and their 1-oxyls. 3,971,757, Cl. 260-45.80N.

Rasmussen, Holgar, to Georgia-Pacific Corporation. Door lock. 3,971,237, Cl. 70-99.000.

Ratouis, Roger: *See—*
Humbert, Daniel; and Ratouis, Roger, 3,971,798.

Raychem Corporation: *See—*
Levinsohn, Richard, deceased; Levinson, Joseph, administrator-with-will-annexed; and Jervis, James E., 3,971,566.

Raymond International Inc.: *See—*
Godley, Augustus P., 3,971,227.

Raymond Lee Organization, Inc., The: *See—*
French, Neil S., 3,971,330.
Garza, Jose G., 3,971,109.

Raynaud, Guy M.: *See—*
Fauran, Claude P.; Eberle, Jeannine A.; Bourgery, Guy R.; Raynaud, Guy M.; and Pourrias, Bernard M., 3,971,793.

Raytheon Company: *See—*
Thies, Wilbur H., Jr., 3,971,125.

RCA Corporation: *See—*
Keizer, Eugene Orville, 3,972,064.
Liu, Shing-gong, 3,972,012.

Rebosio, Sergio. Method for making insulators and insulators thus obtained. 3,971,128, Cl. 29-631.000.

Recor, Inc.: *See—*
Clement, John B., 3,971,474.

Rediger, John R.: *See—*
Bowen, Robert B.; Maier, Roger F.; and Rediger, John R., 3,971,564.

Redmond, John D.: *See—*
Batzer, Richard R.; and Redmond, John D., 3,971,197.

Reed Tool Company: *See—*
Murdoch, Henry W.; and Schumacher, Percy W., Jr., 3,971,600.

Regalbuto, John A., to General Dynamics Corporation. Apparatus and method for vacuum hot press joining, compacting and treating of materials. 3,971,875, Cl. 13-31.000.

Regie Nationale des Usines Renault: *See—*
Ballini, Andre; and Bailly, Roger, 3,971,111.
Duchenne, Henri, 3,971,433.
Froumajou, Armand, 3,971,349.

Reid, Charles M, to Elast-O-Cor Products & Engineering Limited. Hydrocyclone separator or classifier. 3,971,718, Cl. 210-84.000.

Reid, Joyce: *See—*
Hauck, Frederic P.; Sundeen, Joseph E.; and Reid, Joyce, 3,971,823.

Reigel, James: *See—*
Dann, Fred M.; and Reigel, James, 3,971,911.

Relis, Matthew J.: *See—*
Andreaggi, Joseph R.; Graf, Robert J.; and Relis, Matthew J., 3,972,068.

Renholt, Arnkjell, to A/S Norclean. Vacuum cleaner, operated by compressed air. 3,971,096, Cl. 15-326.000.

Repay, Laszlo N.: *See—*
Fukayama, Gary P.; and Repay, Laszlo N., 3,972,070.

Republic Tool & Manufacturing Corporation: *See—*
McRoskey, John W.; Swartz, Delbert D.; and LeBrun, Michel A., Jr., 3,971,488.

Research Company: *See—*
Brownlee, Robert R.; Tyers, Frank O.; and Volz, Carl, Sr., 3,971,389.

Reusser, Robert E., to Phillips Petroleum Company. Solid pesticidal chlorinated phenolic concentrates. 3,971,810, Cl. 424-347.000.

Reynolds Metals Company: *See—*
Price, Herbert K., 3,971,873.

Rhodes, William Jackson, to Pilkington Brothers Limited. Stirring of molten glass. 3,971,646, Cl. 65-157.000.

Rhodia, Inc.: *See—*
Gradeff, Peter S., 3,971,830.

Rhone-Poulenc Industries: *See—*
Helgorsky, Jacques; and Leveque, Alain, 3,971,843.

Rhone-Poulenc S.A.: *See—*
Mourier, Emile, 3,971,831.

Richards, William; and Grolman, Bernard, to American Optical Corporation. Artificial intraocular lens. 3,971,073, Cl. 3-13.000.

Richt, Oskar Hubert, to Uher Werke Munchen. Device for introducing and ejecting a magnetic tape cassette for a magnetic tape recorder. 3,972,072, Cl. 360-93.000.

Richter, Hans Heinrich, to Leesona Corporation. Process and apparatus for continuous heat setting of carpet yarns. 3,971,200, Cl. 57-34.0HS.

Richter, Robert Julius: *See—*
Forbes, Robert Stafford; Herrick, Gary Dean; and Richter, Robert Julius, 3,971,368.

Rickard, Thomas A.: *See—*
Wagner, Frederick William, Jr.; and Rickard, Thomas A., 3,971,271.

Rieder, Rudolf: *See—*
Bachmann, Robert; Bearda, Pieter; Stoidl, Walter; Brandli, Gerold; and Rieder, Rudolf, 3,971,968.

Riemenschneider, Don H.; Townsend, William L.; and Pehoushek, Joseph W., to Zonic Technical Laboratories, Inc. Variable length shift register alternately operable to store and recirculate data and addressing circuit therefor. 3,972,031, Cl. 340-173.00R.

Rikagaku Kenkyusho: *See—*
Hashimoto, Tohru; Kawarada, Akira; and Tamura, Sachiko, 3,971,651.

Rikukawa, Katsuji; and Onogi, Kenji, to Nippon Kogaku K.K. Apparatus for measuring two different fluorescences of a sample. 3,971,951, Cl. 250-458.000.

Ripper, Karl: *See—*
Menrad, Berthold; Ripper, Karl; Ilg, Rudolf; and Dietrich, Georg, 3,971,632.

Riverside Press, Inc.: *See—*
O'Neal, Cothburn M.; Mayo, Alfred M.; and Childs, George William, deceased, 3,971,914.

Roanwell Corporation: *See—*
Foley, James P., 3,971,900.
Foley, James P., 3,971,901.

Robert Bosch G.m.b.H.: *See—*
Hirt, Adam; and Roderer, Herbert, 3,971,977.

Roberto, Gerard: *See—*
Bodocsi, Andrew; Hoge, John H.; Hubbard, John H.; Hubbard, S. Jackson; and Roberto, Gerard, 3,971,179.

Robinson, Gene C., to Ethyl Corporation. Sequestering agent. 3,971,728, Cl. 252-180.000.

Robison, Russell O.: *See—*
Griffies, David R.; Robison, Russell O.; and Taylor, Robert W., 3,971,132.

Rochon, Marcel A. Process and apparatus for decreasing moisture content in wood. 3,971,139, Cl. 34-13.800.

Rockwell International Corporation: *See—*
Griffies, David R.; Robison, Russell O.; and Taylor, Robert W., 3,971,132.
Smith, Raymond W., Jr., 3,971,544.

Rodder, Jerome A. Fluid measuring apparatus. 3,971,247, Cl. 73-27.00R.

Roderer, Herbert: *See—*
Hirt, Adam; and Roderer, Herbert, 3,971,977.

Roe, Richard C., to Sealy, Incorporated. Box spring unit with metal slats. 3,971,081, Cl. 5-246.000.

Roenna, Robert Fred, to St. Regis Paper Company. Tear open and relockable container. 3,971,506, Cl. 229-51.01C.

Rogler, Walter: *See—*
Lenz, Arnold; and Rogler, Walter, 3,971,833.

Rogora, Edoardo; and Giraudi, Walter, to Alfa Romeo S.p.A. Pulse generator for providing information as to the rate of rotation and phasing of an engine to an electronic apparatus intended to govern the fuel feed to an internal combustion engine of the fuel injection type. 3,971,958, Cl. 307-106.000.

Rohm and Haas Company: *See—*
Myers, Robert M.; Dunkelberger, David L.; and Carty, Daniel T., 3,971,835.

Rohr Industries, Inc.: *See—*
Molzon, William R., 3,971,455.
Tantlinger, Keith W.; and Schubach, Theodor C., 3,971,580.

Rohrssen, Donald J. Safe electrical connector. 3,971,619, Cl. 339-189.00R.

Rollins, John H., Jr., to United States of America, Army. Combined helicopter flight controller. 3,971,536, Cl. 244-83.00F.

Roman, Steven A.: *See—*
Tieman, Charles H.; Kollmeyer, Willy D.; and Roman, Steven A., 3,971,774.

Romankiw, Lubomyr T., to IBM. Anodized articles and process of preparing same. 3,971,710, Cl. 204-15.000.

Rommens, Michel: *See—*
Porte, Robert; and Rommens, Michel, 3,971,593.

Rosberg, Bengt A.: *See—*
Soukup, Franz; Rosberg, Bengt A.; Larsson, Tore I.; and Brunlid, John-Erik, 3,971,192.

Rose, Manning I. Safety socket for lamps and the like. 3,971,611, Cl. 339-34.000.

Rose, Willis Earl, to Dresser Industries, Inc. Start-up compressed air system for gas turbine engines. 3,971,210, Cl. 60-39.140.

Rosen, Sidney. Valve system for filling machines. 3,971,494, Cl. 222-450.000.

Rosenberg, Lee J.; and Wolf, E. Mark, to Anaconda Company, The. High frequency cable with bridging strip. 3,971,879, Cl. 174-36.000.

Rosenberger, Siegfried; and Schwarzenbach, Kurt, to Ciba-Geigy Corporation. 3-Hydroxybenzyl-oxadiazolone and -thiadiazolone derivatives. 3,971,803, Cl. 260-307.00A.

Ross, Gerald F., to Sperry Rand Corporation. Base-band pulse object sensor system. 3,971,990, Cl. 325-400.000.

Rossaert, Edgard Emile Charles, to U.S. Philips Corporation. Device for winding toroidal deflection coils. 3,971,516, Cl. 242-4.00B.

Rott, Gunther: *See—*
Bredow, Walter; Tamaschke, Walter; and Rott, Gunther, 3,971,281.

Rousseau, Genevieve; and Torelli, Vesperto, to Roussel-UCLAF. Novel steroids and their use. 3,971,777, Cl. 260-239.500.

Roussel-UCLAF: *See—*
Humbert, Daniel; and Ratouis, Roger, 3,971,798.
Rousseau, Genevieve; and Torelli, Vesperto, 3,971,777.

Rowland-Hill, Edward W., to Sperry Rand Corporation. Infeed control for combine elevator. 3,971,195, Cl. 56-14.600.

Rowland-Hill, Edward W.: *See—*
McDuffie, James W.; Focht, Claude K.; and Rowland-Hill, Edward W., 3,971,390.

RTE Corporation: *See—*
Mikulecky, Harvey W., 3,972,015.

Rubinstein, Leon, to Polaroid Corporation. Molding devices and process for making a molded plastic lens mount. 3,971,841, Cl. 264-275.000.

Rubio, Manuel Jesus: *See—*
Longenecker, John G.; and Rubio, Manuel Jesus, 3,971,481.

Ruderer, Clifford G., to Ferro Corporation. Direct-on ceramic coating of carbon-rich iron. 3,971,120, Cl. 29-460.000.

Rudge, Sydney James, to Glacier Metal Company Limited, The. Structural bearings. 3,971,598, Cl. 308-3.00R.

Rudowicz, Mark J.: *See—*
Osterhout, Richard E.; McCray, Walter A.; and Rudowicz, Mark J., 3,971,117.

Rudy, Erwin. Spinodal carbonitride alloys for tool and wear applications. 3,971,656, Cl. 75-203.000.

Ruegg, Frank A., to Beckman Instruments, Inc. Bandpass filter. 3,972,006, Cl. 330-107.000.

Ruger, William B.; and Larson, Lawrence L., to Sturm, Ruger & Co. Inc. Top lever retaining means for break-open firearms. 3,971,150, Cl. 42-44.000.

Ruhrchemie Aktiengesellschaft: *See—*
Birnkraut, Hans-Walter; and Kluy, Werner, 3,971,690.

Saab-Scania Aktiebolag: *See—*
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Saba, Richard T.: *See—*
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Saffren, Melvin M.: *See—*
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Saft-Societe des Accumulateurs Fixes et de Traction: *See—*
Coueille, Daniel, 3,971,673.

Sagel, John A.; and Weber, Clarence Edward, to Procter & Gamble Company, The. Acid mix process. 3,971,815, Cl. 260-400.000.

Sahrbacker, Edward V., to Lucerne Products, Inc. Trigger-lock control. 3,971,906, Cl. 200-157.000.

Saikaishi, Noboru; Yamada, Tsuneo; Takahashi, Tetsuo; and Numata, Yukio, to Trio Electronics Incorporated. Apparatus for presetting receivers of the synthesizing type. 3,971,992, Cl. 325-464.000.

St. Clair, Theodore A., to Textron, Inc. Gas pressure regulator having low pressure shut-off means. 3,971,410, Cl. 137-613.000.

St. Regis Paper Company: *See—*
Roenna, Robert Fred, 3,971,506.

Saipem S.p.A.: *See—*
Silvestri, Antonio; and Brando, Pasquale, 3,971,228.

Saito, Minoru, to Nihon Electronic Industry Co. Ltd. Method and apparatus for measuring the number of stacked corrugated cardboards. 3,971,918, Cl. 235-92.0SB.

Sakai, Kiyoshi; Yusa, Takashi; and Inoue, Kenji, to Sankyo Company Limited. Pharmaceutically useful prostenoic acid derivatives. 3,971,825, Cl. 260-514.00D.

Sakakura, Kazufusa: *See—*
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Sakashita, Tetsuzi: *See—*
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Sandrock, Harold E.; Stark, Edward W.; and Gyori, Steven A., to Technicon Instruments Corporation. Apparatus and method for batch-type analysis of liquid samples. 3,971,630, Cl. 23-230.00R.

Sandvik Aktiebolag: *See—*
Ahlberg, Erik; Carlvik, Ingvar; Liljekvist, Bernt Soren; and Haglund, Anders Carl Gustaf, 3,971,447.

Sankyo Company Limited: *See—*
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Norita, Toshimasa; Ibara, Hisato; Murakami, Masahiro; and Okano, Masao, 3,971,705.

Sasaki, Shigeru; and Nakamura, Kiichi, to Hitachi, Ltd. Method for manufacturing cylindrical armature. 3,971,124, Cl. 29-598.000.

Sasaki, Takashi: *See—*
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Sasnett, Russel M.: *See—*
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Sasnett, Russell M., to Sasnett, Russel M. Modular furnishings. 3,971,605, Cl. 312-198.000.

Sato, Akira: *See—*
Nakazawa, Yoshiyuki; Nakamura, Yasuharu; Sueyoshi, Tohru; and Sato, Akira, 3,971,664.

Sato, Masamichi; and Miyazuka, Hajime, to Xerox Corporation. Color electrophotographic process using photoconductive particles in liquid developer. 3,971,659, Cl. 96-1.200.

Satzinger, Gerhard; Herrmann, Manfred; and Vollmer, Karl-Otto, to Warner-Lambert Company. Thiazolidinone acetic acid derivatives. 3,971,794, Cl. 260-293.680.

Satzinger, Gerhard: *See—*
Stoss, Peter Johannes; Herrmann, Manfred Franz Reinhold; and Satzinger, Gerhard, 3,971,814.

Saunders, John Christopher: *See—*
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Archibald, John Leheup; Boyle, John Terence Arnott; and Saunders, John Christopher, 3,971,789.

Saunders, Walter Selden. Drag reducer for land vehicles. 3,971,586, Cl. 296-1.00S.

Saunier Duval: *See—*
Gouyou-Beauchamps, Jacques, 3,971,344.

Sawluk, Wlodzimierz, to Ernst Winter & Sohn. Method of and arrangement for dressing of grinding wheels. 3,971,358, Cl. 125-11.0CD.

Sawyer, Michael J. Plastic barricade panel. 3,971,331, Cl. 116-63.00P.

Scandia Packaging Machinery Company: *See—*
Anderson, Andrew W., 3,971,467.

Schaaf, Thomas K.: *See—*
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Schade, Jorg: *See—*
Wertelewski, Wilhelm; and Schade, Jorg, 3,971,225.

Schank, Richard L.; and Gunther, Wolfgang H. H., to Xerox Corporation. Process for smoothing waterless lithographic masters. 3,971,316, Cl. 101-465.000.

Schatka, Gunther: *See—*
Kruger, Wilm; Schatka, Gunther; and Pietruska, Joachim, 3,971,912.

Scheffler, Knut: *See—*
Hild, Werner; Krause, Helmut; Scheffler, Knut; Gusten, Hans; Gilbert, Ernst; and Koster, Rainer, 3,971,717.

Schellenberg, Heinz, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Apparatus for cocking a breechblock. 3,971,291, Cl. 89-1.00K.

Schemith, Gerard, to Scovill Manufacturing Company. Union device for flexible tubing. 3,971,577, Cl. 285-238.000.

Schemith, Gerard, to Scovill Manufacturing Company. Union device for flexible tubing. 3,971,578, Cl. 285-260.000.

Schenley Industries, Inc.: *See—*
Whyte, Adrian Alan, 3,971,504.

Schickling, Joseph H.; Blake, John L., Jr.; and Hyduk, Walter, to SKF Industries, Inc. Seal assembly for pillow block housing. 3,971,565, Cl. 277-59.000.

Schinski, William L., to Chevron Research Company. Herbicidal N^1-methoxycarbonyl-N^1-alkyl-3,5-dinitro-N^4,N^4-dialkylsulfanilamide. 3,971,650, Cl. 71-103.000.

Schlage, Robert E., to ACF Industries, Incorporated. Solenoid-dashpot. 3,971,356, Cl. 123-198.00D.

Schlichte, Max, to Siemens Aktiengesellschaft. Timing apparatus for PCM/TDM switching networks. 3,971,892, Cl. 179-15.0BA.

Schlumberger Technology Corporation: *See—*
Nelligan, William B., 3,971,935.

Schmidt, Paul Herman: *See—*
Bachmann, Klaus Jurgen; Nagel, Suzanne Rose; Pearson, Arthur David; Schmidt, Paul Herman; and Tynes, Arthur Richard, 3,971,645.

Schmit, David E.; and Wedig, Frank L., Jr., to Cincinnati Electronics Corporation. Apparatus for distinguishing time varying analog signals. 3,971,921, Cl. 235-151.350.

Schmitt, Arthur L.: *See—*
United States of America, National Aeronautics and Space Administration; Flippin, Anne; and Schmitt, Arthur L., 3,971,915.

Schmitt, Donald J., to Therm-O-Disc Incorporated. Thermostat. 3,972,016, Cl. 337-354.000.

Schneider, Charles A.; and Cake, William R., to Sherwin-Williams Company, The. Electroconductive paper. 3,971,680, Cl. 428-537.000.

Schneider, Eckart: *See—*
Leitz, Ludwig; Heitmann, Knut; and Schneider, Eckart, 3,972,021.

Schneider, Raymond T., to Davy Powergas Inc. Method for removing sodium sulfate from aqueous solutions. 3,971,844, Cl. 423-182.000.

Schneider, Siegfried; Thate, Kurt; Geyken, Erwin; Kempe, Horst; and Macher, Stephan, to AGFA-Gevaert, A.G. Method of making roller. 3,971,115, Cl. 29-148.40D.

Schnyder, Conrad W., to Neuco Apparatebau AG. Fabric hand towel dispenser. 3,971,607, Cl. 312-38.000.

Schottler, Henry. Fluid transducer. 3,971,259, Cl. 74-25.000.

Schreiber, Gunter: *See—*
Lohr, Alfred; Schwan, Wolfgang; Tschek, Wolfgang; and Schreiber, Gunter, 3,971,420.

Schreier, Wilford R., to Hammond Corporation. Plural mode envelope generator for voltage controlled amplifier. 3,971,284, Cl. 84-1.260.

Schriber, Gene A.: *See—*
Means, Rodney J.; and Schriber, Gene A., 3,971,960.

Schroeder, Franklin T.; and McAllister, John P., to Burroughs Corporation. Programmable microprocessor. 3,972,024, Cl. 340-172.500.

Schroeder, Paul Robert, to Bell Telephone Laboratories, Incorporated. High speed current detection amplifier circuit. 3,972,003, Cl. 330-30.00D.

Schubach, Theodor C.: *See—*
Tantlinger, Keith W.; and Schubach, Theodor C., 3,971,580.

Schukei, Glen Elwin: *See—*
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Schuler, Claus: *See—*
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Schumacher, Percy W., Jr.: *See—*
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Schurmann, Horst; Bung, Josef; and Van Aalten, Hendrikus Alouisius, to Akzona Incorporated. Process for producing a cationic polyurethane. 3,971,764, Cl. 260-77.5AM.

Schwan, Thomas J., to Morton-Norwich Products, Inc. 2-Methyl-3-phenyl-1,2,3,10b-tetrahydroindeno[1,2,3-ij]-isoquinoline hydrobromide. 3,971,788, Cl. 260-286.00R.

Schwan, Wolfgang: *See—*
Lohr, Alfred; Schwan, Wolfgang; Tschek, Wolfgang; and Schreiber, Gunter, 3,971,420.

Schwartz, Michael A.: *See—*
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Schwarzenbach, Kurt: *See—*
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Schwarzler, Peter: *See—*
Winkle, Gunther; Schwarzler, Peter; Otto, Peter H.; Molzer, Peter; and Walkner, Christian, 3,971,537.

Schweiger, Fritz; and Wohler, Jurgen, to Hochtemperatur-Kernkraftwerk Gesellschaft mit beschrankter Haftung (HKG), Gemeinsames Europaisches. Reaction vessels charged with spherical elements. 3,971,444, Cl. 176-32.000.

Schwent, Glennon V., to Garrett Corporation, The. Gas turbine fuel control. 3,971,208, Cl. 60-39.030.

SCM Corporation: *See—*
Davis, Gerald G.; and Keough, Joan M., 3,971,708.

Scofield, Bruce A., to International Harvester Company. Computer means for sequential fuel injection. 3,971,348, Cl. 123-32.0EA.

Scott & Fetzer Company, The: *See—*
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Scott, Thomas W. Method of cleaning tubular members on a rig floor. 3,971,442, Cl. 166-315.000.

Scovill Manufacturing Company: *See—*
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Sea Life Exhibits, Inc.: *See—*
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Sealy, Incorporated: *See—*
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Sedgwick, Thomas O.: *See—*
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Seibert, Carl F., Jr.: *See—*
Heinbaugh, Kenneth D.; and Seibert, Carl F., Jr., 3,971,075.

Seidman, Ady; Avrahami, Zohar; Sheinfux, Benjamin; Grinberg, Jan; and Shimoni, Uri, to Ramot University Authority for Applied Research and Industrial Development Ltd. Gamma-ray camera including novel converter matrix useful therein. 3,971,942, Cl. 250-363.00S.

Seismograph Service Corporation: *See—*
Bassett, Edward James, 3,972,019.

Seki, Ikuo; and Kato, Masahiko, to Toppan Printing Co., Ltd.; and Hitachi Electronics Ltd. Method for image regulation of color monitors in proof-viewing and an apparatus therefor. 3,972,066, Cl. 358-76.000.

Seki, Mitsuaki: *See—*
Ozawa, Masayoshi; Machida, Minoru; Kawabata, Yoichi; and Seki, Mitsuaki, 3,971,924.

Sekiguchi, Koichi: *See—*
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Sekiguchi, Kouichi, to Iwasaki Tsushinki Kabushiki Kaisha. Two-tone generator using switching transistors in LC resonant circuits controlled by push-button. 3,971,896, Cl. 179-84.0VF.

Semi-Elements, Inc.: *See—*
Christensen, Ralph W.; Smith, Everett C.; and Tibol, George, 3,971,870.

Sergent, Andre. Safety valve. 3,971,403, Cl. 137-459.000.

Servicemaster Industries, Inc.: *See—*
Hufton, Austen B., 3,971,643.

Setterquist, Robert Alton, to Du Pont de Nemours, E. I., and Company. Olefin polymerization catalyst system and process for polymerization of olefins. 3,971,767, Cl. 526-65.000.

Seversen, Gordon F. Control means for a vending machine. 3,971,464, Cl. 194-10.000.

Sewell, Kenneth G.; and Volz, William B., to Varo, Inc. Apparatus for enhancing the long wavelength response of photodetectors. 3,971,932, Cl. 250-213.0VT.

Sewell, Kenneth G.; Herrington, James R.; and Volz, William B., to Varo, Inc. Quantum counter with temporal discrimination. 3,971,941, Cl. 250-330.000.

Shah, Bipin J.: *See—*
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Shamash, Maurice B.: *See—*
Lindberg, Frank A.; Konsowski, Stephen G.; Shamash, Maurice B.; and Ponemone, Seymour J., 3,971,661.

Shanahan, William F. Tool and kit for electrical fishing. 3,971,543, Cl. 254-134.30R.

Shapiro, Sanford S., to Hughes Aircraft Company. Adjustable sliding electrical contact for waveguide post and coaxial line termination. 3,972,013, Cl. 333-97.00R.

Shaw, Richard G.: *See—*
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Sheets, Ronald E.: *See—*
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Sheinfux, Benjamin: *See—*
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Shell Oil Company: *See—*
Martin, James M., Jr.; Heaton, Roy C.; and Coe, Richard H., 3,971,434.
Tieman, Charles H.; Kollmeyer, Willy D.; and Roman, Steven A., 3,971,774.
Uzelmeier, Christopher W.; and Jones, Paul D., 3,971,834.

Shen, Tsung-Ying; Jones, Howard; Mulvey, Dennis M.; and Dorn, Conrad P., to Merck & Co., Inc. *S,S'*-bis(pyridylmethyl)-carbonodithioates. 3,971,797, Cl. 260-294.80E.

Shen, Tsung-Ying: *See—*
Wagner, Arthur F.; Holly, Frederick W.; Lin, Tsau-Yen; Shen, Tsung-Ying; and Hirschmann, Ralph F., 3,971,736.

Shepherd, Geoffrey, to Ferranti, Limited. Frequency comparison circuit. 3,971,994, Cl. 328-133.000.

Sherman, Micheal I., to Kamyr, Inc. Solids level indicator. 3,971,254, Cl. 73-290.00R.

Sherwin-Williams Company, The: *See—*
Schneider, Charles A.; and Cake, William R., 3,971,680.

Sherwood Medical Industries Inc.: *See—*
Corbett, Joseph H., 3,971,385.

Shibata, Norio: *See—*
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Shimai, Junichiro, to Murata Kikai Kabushiki Kaisha. Apparatus for doffing and inserting empty cores on an automatic winder. 3,971,520, Cl. 242-35.50A.

Shimoni, Uri: *See—*
Seidman, Ady; Avrahami, Zohar; Sheinfux, Benjamin; Grinberg, Jan; and Shimoni, Uri, 3,971,942.

Shinitzky, Meir: *See—*
Inbar, Michael; and Shinitzky, Meir, 3,971,952.

Shio, Megumu, to Nippon Kogaku K.K. Rectilinearly guiding device. 3,971,599, Cl. 308-3.00A.

Shionogi & Co., Ltd.: *See—*
Maekawa, Hideyuki; and Ishitobi, Kaoru, 3,971,702.

Showa Denko Kabushiki Kaisha: *See—*
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Showa Yakuhinkako Kabushiki Kaisha: *See—*
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Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Shtanko, Jury Pavlovich; Tsukanov, Georgy Emmanuilovich; Bogachenko, Alexei Georgievich; Bondarenko, Oleg Petrovich; Martyn, Viktor Mikhailovich; Baglai, Vitaly Mikhailovich; Stupak, Leonid Mikhailovich; Artamonov, Viktor Leonidovich; and Pavliichuk, Georgy Anatolievich, 3,971,430.

Shulick, Robert J.: *See—*
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United States of America, National Aeronautics and Space Administration; Feldstein, Cyril; Lewis, Gilbert W.; Silver, Robert H.; and Culler, Virgil H., 3,971,364.

Silvestri, Antonio; and Brando, Pasquale, to Saipem S.p.A. Process and system for lifting submarine pipelines. 3,971,228, Cl. 61-114.000.

Silvey, George E. Method of tree felling. 3,971,422, Cl. 144-34.00B.

Simmons, Frank A., to Burgess Vibrocrafters, Inc. Sprayer nozzle construction. 3,971,408, Cl. 137-604.000.

Singer, Abraham; and Minkowski, Jan M., to United States of America, Army. Method and system for absolute measurement of noise power at all radio frequencies. 3,971,989, Cl. 325-363.000.

Singer Company, The: *See—*
Peters, David L., 3,972,067.

Sisson, Ronald Loren: *See—*
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Sittmann, Brigitte, to Vereinigte Baubeschlagfabriken Gretsch and Co. GmbH. Safety ski binding. 3,971,567, Cl. 280-618.000.

Skala, Stephen F. Ink drop printer with transfer members. 3,972,053, Cl. 346-75.000.

Skelcey, James S., to Dow Chemical Company, The. Preparation of beryllium hydride and aluminum hydride. 3,971,846, Cl. 423-645.000.

SKF Industrial Trading and Development Company, B.V.: *See—*
Kapaan, Jan Hendrikus, 3,971,604.

SKF Industries, Inc.: *See—*
Schickling, Joseph H.; Blake, John L., Jr.; and Hyduk, Walter, 3,971,565.

Skrmetta, Raphael Q. Shrimp peeler roller system. 3,971,102, Cl. 17-73.000.

Slack, Keith K.: *See—*
Bodner, Ronald E.; Cianciosi, Mario N.; Crooks, Thomas L.; Magrisso, Israel B.; Slack, Keith K.; and Smith, Richard S., 3,972,023.

Slater, Saul I. Convertible airship. 3,971,533, Cl. 244-30.000.

Slomski, Waclaw Kazimierz. Device for testing the ability of a person to recognize synchronous speeds. 3,971,143, Cl. 35-22.00R.

Slosiar, Julius, to BBC Brown Boveri & Company Limited. Cylindric grid electrode structure for electronic tubes comprising carbon filaments coated with pyrolytic graphite. 3,971,964, Cl. 313-355.000.

Small, Edward A., Jr.: *See—*
Gelber, Robert M.; and Small, Edward A., Jr., 3,971,869.

Smith, Arnold Ray: *See—*
Faust, Carl Walter; and Smith, Arnold Ray, 3,971,894.

Smith, Benjamin James: *See—*
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Smith, Donald R.: *See—*
Peters, Leo; Dymit, Joseph M.; Lilley, James C.; Smith, Donald R.; and Warners, Henry, 3,971,273.

Smith, Everett C.: *See—*
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Smith, Frank R.: *See—*
Gadd, Ronald O. C.; Quarmby, Robert C.; and Smith, Frank R., 3,971,089.

Smith, Frank R., Jr.; Kenney, Edward J.; and DiSalvo, Walter A., to Colgate-Palmolive Company. Process for lowering the bulk density of alkali making built synthetic detergent compositions. 3,971,726, Cl. 252-132.000.

Smith, James T.: *See—*
Aspelin, Gary B.; and Smith, James T., 3,971,369.

Smith Kline & French Laboratories Limited: *See—*
Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, 3,971,786.

Smith, Leland B., to Beckman Instruments, Inc. Bioelectrical impedance measuring system. 3,971,365, Cl. 128-2.10Z.

Smith, Raymond W., Jr., to Rockwell International Corporation. Apparatus for guiding a rod into a conduit. 3,971,544, Cl. 254-134.3FT.

Smith, Richard S.: *See—*
Bodner, Ronald E.; Cianciosi, Mario N.; Crooks, Thomas L.; Magrisso, Israel B.; Slack, Keith K.; and Smith, Richard S., 3,972,023.

Smith, William D.: *See—*
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Societe d'Etudes et de Construction de Materiel Electronique - S.E.C.M.E.: *See—*
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Societe Internationale: *See—*
Moreno, Roland, 3,971,916.

Solf, Johannes; and Feine, Wolfgang. Brush handles. 3,971,094, Cl. 15-143.00R.

Solitron Devices, Inc.: *See—*
Christensen, Ralph W.; Smith, Everett C.; and Tibol, George, 3,971,870.

Sommer, Richard; Rainer, Georg; and Wolfrum, Gerhard, to Bayer Aktiengesellschaft. Disulfimide disazo dyestuffs. 3,971,770, Cl. 260-186.000.

Sony Corporation: *See—*
Hideshima, Yasuhiro; and Toyoshima, Masakatsu, 3,971,986.
Murakami, Masao; Amaya, Akio; and Kawakita, Masaru, 3,971,865.

Sorgenfrei, Jurgen: *See—*
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Soukup, Franz; Rosberg, Bengt A.; Larsson, Tore I.; and Brunlid, John-Erik, to Tetra Pak Development. Device for the displacement of filling material and the shaping of a material web in a packing machine. 3,971,192, Cl. 53-184.00R.

South African Inventions: *See—*
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Spangler, Michael J.: *See—*
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Speedrack Inc.: *See—*
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Speiser, Jeffrey M.; and Federhen, Herbert M., to United States of America, Navy. Modular discrete cosine transform system. 3,971,927, Cl. 235-186.000.

Sperry Rand Corporation: *See—*
McDuffie, James W.; Focht, Claude K.; and Rowland-Hill, Edward W., 3,971,390.
Ross, Gerald F., 3,971,990.
Rowland-Hill, Edward W., 3,971,195.

Spier, I. Martin. Hull construction and method for forming same. 3,971,084, Cl. 9-6.00P.

Spoeth, Carl R., Jr., to Dart Industries Inc. Insulated server. 3,971,360, Cl. 126-373.000.

Sprenkle, George J., to Burroughs Corporation. Dressing finger for automatic wiring machines. 3,971,419, Cl. 140-93.00R.

Sprung, Hartwig: *See—*
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Staehle, Henry C., to Eastman Kodak Company. Lithographic printing plate comprising hydrophilic layer of polyvinylacetate crosslinked with tetraethylorthosilicate. 3,971,660, Cl. 96-33.000.

Stahlwerke Peine-Salzgitter Aktiengesellschaft: *See—*
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Staisch, Diether, to WABCO Westinghouse GmbH. Pump unloading valve device. 3,971,397, Cl. 137-116.000.

Stamicarbon B.V.: *See—*
Boesten, Wilhelmus H. J., 3,971,700.

Stanaitis, Peter P., to Textron, Inc. Method of fabricating a fastener assembly. 3,971,086, Cl. 10-155.00A.

Standard Oil Company: *See—*
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Stange, Klaus K., to Xerox Corporation. Sheet stacker. 3,971,554, Cl. 271-195.000.

Stanke, Walter; and Mertens, Gottfried, to Heinrich Koppers Gesellschaft mit beschrankter Haftung. Apparatus for cleaning the sealing surfaces of coke oven doors and door jambs. 3,971,092, Cl. 15-93.00A.

Stanley Works, The: *See—*
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Stern, Thomas Edwin: *See—*
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Sterner, Erik; and Nilsson, Elving. Feeding system. 3,971,339, Cl. 119-52.0AF.

Stevenson, James S. Power mower. 3,971,196, Cl. 56-17.100.

Stevenson, Mayne B., to Arvey Corporation. Folded money pack envelope. 3,971,507, Cl. 229-72.000.

Stich, Frederick A., to Allis-Chalmers Corporation. Transistor inverter motor drive having voltage boost at low speeds. 3,971,972, Cl. 318-227.000.

Stith, Joe D.: *See—*
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Stoss, Peter Johannes; Herrmann, Manfred Franz Reinhold; and Satzinger, Gerhard, to Warner-Lambert Company. Benzo(b)thiophene derivatives. 3,971,814, Cl. 260-330.500.

Strow, Lawrence Evans; and Bolth, Franklin Anderson, to Mineral Corporation. Amine-stabilized dialkyl dithiophosphates. 3,971,836, Cl. 260-963.000.

Stupak, Leonid Mikhailovich: *See—*
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Sugarman, Edward D., to Wal-Gen Corporation. Mixing and detoxification tank with filtration system. 3,971,644, Cl. 55-387.000.

Sugimura, Shojiro, to Mitsui Shipbuilding and Engineering Co., Ltd. Shaft sealing apparatus using a fluid sealing system. 3,971,563, Cl. 277-27.000.

Suhr, Donald C.: *See—*
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Sumitomo Electric Industries, Ltd.: *See—*
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Swanson, Roger; Thompson, Duncan M.; and Shulick, Robert J., to Babson Brothers Company. Method of and apparatus for processing cattle excrement. 3,971,720, Cl. 210-196.000.

Swartz, Delbert D.: *See—*
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Sytsma, Frederick R., to C. L. Frost & Son, Inc. Sanitary anti-friction trolley wheel. 3,971,601, Cl. 308-16.000.

Tada, Masao, to Mitsui Pharmaceuticals, Incorporated. 5-Fluorouracil derivatives. 3,971,784, Cl. 260-256.50R.

Taddei, Vincent J., to Burroughs Corporation. Expanded memory paging for a programmable microprocessor. 3,972,025, Cl. 340-172.500.

Tajima, Hidemi; Asahara, Yoshiyuki; and Izumitani, Tetsuro, to Hoya Glass Works, Ltd. Glass for Faraday rotator element. 3,971,723, Cl. 252-62.510.

Takahashi, Tetsuo: *See—*
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Takinami, Koichi; Tanaka, Takashi; Chiba, Michiaki; and Hirose, Yoshio, to Ajinomoto Co., Inc. Method for producing L-glutamic acid by fermentation. 3,971,701, Cl. 195-47.000.

Tamaschke, Walter: *See—*
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Tanaka, Akio, to Zenith Radio Corporation. Television tuning system with varactor malfunction detection. 3,971,991, Cl. 325-464.000.

Tanaka, Nobuyoshi: *See—*
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Tanney, Oliver Morley, to Goodren Products Corporation. Display device. 3,971,149, Cl. 40-126.00A.

Tantlinger, Keith W.; and Schubach, Theodor C., to Rohr Industries, Inc. Dual releasable window latch mechanism for transit vehicle. 3,971,580, Cl. 292-201.000.

Tardiff, Armand L.; Broughton, Glover F.; Delorey, David R.; and Pearson, Bangt R., to USM Corporation. Machines for sequencing diverse components. 3,971,193, Cl. 53-198.00R.

Tayama, Hiromitsu: *See—*
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Taylor, Allen L., to Minnesota Mining and Manufacturing Company. Electret sensing medium having plural sensing units. 3,971,250, Cl. 73-88.50R.

Taylor, Don A. Particle filled self-conformable cushion and method of making same. 3,971,839, Cl. 264-112.000.

Taylor, Duane F.; Everett, Richard C.; Everett, Harry F.; and Williams, Norman C. Apparatus for augmenting venous blood flow. 3,971,398, Cl. 137-119.000.

Taylor, Franklyn H.; and Finck, Edward J., to General Electric Company. Turbine control system. 3,971,219, Cl. 60-660.000.

Taylor & Gaskin, Inc.: *See—*
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Taylor, Harold J., to Du Pont de Nemours, E. I., and Company. Double-knit elastic fabric with raised patterns. 3,971,234, Cl. 66-200.000.

Taylor, Robert W.: *See—*
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Technical Wire Products, Inc.: *See—*
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Technicon Instruments Corporation: *See—*
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Teijin Limited: *See—*
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Thirion, Philippe Emmanuel: *See—*
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Thomas J. Lipton, Inc.: *See—*
Collier, Peter Dudley; Penman, Alistair; and Trussell, Frederick John, 3,971,858.

Thomas, Richard E.; and Haas, George A., to United States of America, Navy. Method for fabricating an electron-emission cathode. 3,971,110, Cl. 29-25.180.

Thomas, Robert C., to Dow Chemical Company, The. Nonfuming soldering flux. 3,971,675, Cl. 148-26.000.

Thomas Walker Limited: *See—*
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Thompson, David L. Portable vacuum and pressure liquid tank apparatus. 3,971,400, Cl. 137-205.000.

Thompson, Duncan M.: *See—*
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Thompson, William A.: *See—*
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Tieman, Charles H.; Kollmeyer, Willy D.; and Roman, Steven A., to Shell Oil Company. 2-(Nitromethylene)-1,3-diazepines. 3,971,774, Cl. 260-239.0BC.

Timesavers, Inc.: *See—*
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Titan Separator A/S: *See—*
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Torelli, Vesperto: *See—*
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Tornblom, Bengt, to Allmanna Svenska Elektriska Aktiebolaget. Plural frequency multi-phase transducer arrangement for detecting the presence and location of faults in a metal body and compensating for body movements. 3,971,982, Cl. 324-37.000.
Toth, Michael, Jr.; and Jackson, Jean Andre, Jr., to DeLaval Turbine Inc. Means for preventing an engine turbocharger from being damaged by foreign objects. 3,971,218, Cl. 60-597.000.
Tournier, Christian Yves; and Kerihuel, Jean Bernard, to International Standard Electric Corporation. Control system and process for a space-division switching network. 3,971,893, Cl. 179-18.0GE.
Towne Robinson Fastener Company: *See—*
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Townsend Engineering Company: *See—*
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Townsend, Ray T.; and Beasley, Donald L., to Townsend Engineering Company. Apparatus for encasing a product. 3,971,101, Cl. 17-33.000.
Townsend, William L.: *See—*
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Tritsch, Ludwig, to Johnson & Johnson. Disposable diaper having an adhesive closure system and method of construction therefor. 3,971,380, Cl. 128-287.000.
Trombley, Wayne E.; and Jacobson, Lawrence R., to Dow Corning Corporation. Abrasive tape apparatus for contouring a flexible lens. 3,971,163, Cl. 51-62.000.
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Tsujimoto, Kayoshi; Matsui, Tohru; Abe, Haruo; and Horimoto, Mitsuaki, to Minolta Camera Kabushiki Kaisha. Varifocal lens assembly. 3,972,056, Cl. 354-25.000.
Tsukanov, Georgy Emmanuilovich: *See—*
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Tsuruta, Yasuo. Process and device for automatic regulation of the internal pressure in a pneumatic tire. 3,971,425, Cl. 152-418.000.
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Tugwell, John, to Kelor Limited. Pneumatic actuators. 3,971,296, Cl. 91-392.000.
Turpie, Derek W. F.; and Klazar, Jaroslav, to South African Inventions. Textile fiber combing. 3,971,104, Cl. 19-115.00R.
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Ulrich, Erich; and van Liempt, Adrianus Reinier, to Deutsche Babcock & Wilcox Aktiengesellschaft. Devices for the cleaning of heating surfaces. 3,971,343, Cl. 122-379.000.
Underwood, Robert H. Textile spool. 3,971,526, Cl. 242-118.600.
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National Aeronautics and Space Administration; administrator; with respect to an invention of:
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Blue, James W., 3,971,697.
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Vajtay, Leslie. Environmental package. 3,971,160, Cl. 47-34.110.
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Vogel, Charles A., to American Videonetics Corporation. Tape guide assembly for rotating head. 3,972,074, Cl. 360-130.000.
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Wagner, William H. Symmetric padded bandage for injured palm of either hand. 3,971,374, Cl. 128-155.000.
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Wende, Charles W. J., to United States of America, Energy Research and Development Administration. Neutronic reactor. 3,971,699, Cl. 176-52.000.
Wenninger, Freddie W.; Morris, Donald E.; Kohoutek, Jindrich; Maitland, David S.; Clifford, Douglas M.; Schulte, Louis T.; and Keith, John C., to Hewlett-Packard Company. Adaptable programmed calculator having provision for plug-in keyboard and memory modules. 3,971,925, Cl. 235-156.000.
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White, Velton C. X-ray cassette film holder. 3,971,470, Cl. 206-455.000.
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Yxfeldt, Leif Johan. Shower-bath arrangement. 3,971,074, Cl. 4-145.000.

Zaffaroni, Alejandro, to Alza Corporation. Intrauterine device having means for changing from uterine-retentive shape to nonuterine-retentive shape. 3,971,367, Cl. 128-130.000.

Zahnradfabrik Friedrichshafen AG: *See*—
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Zamora, Mario: *See*—
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Zannucci, Joseph Salvatore; and Lappin, Gerald Ray, to Eastman Kodak Company. Polymer compositions containing titanium dioxide having improved visible and ultraviolet light stability. 3,971,755, Cl. 260-42.450.

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Zellweger, Ltd.: *See*—
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Zengerer, Hans. Impact tool. 3,971,244, Cl. 72-395.000.

Zenith Radio Corporation: *See*—
Conger, Robert R., 3,971,490.
Tanaka, Akio, 3,971,991.

Zenker, Karol R., to Factory Mutual Research Corporation. Discharge head having dual function plug retaining member. 3,971,443, Cl. 169-39.000.

Zetlin, Lev. Beamless floor and roof structure. 3,971,181, Cl. 52-263.000.

Ziamatic Corporation: *See*—
Ziaylek, John, 3,971,591.

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Bertorelli, Orlando L.; Mays, Robert K.; Williams, Lloyd E.; and Zimmerman, Howard F., Jr., 3,971,727.

Zindler, Hugh A. Progressively engaged centrifugal clutch. 3,971,463, Cl. 192-105.0BA.

Zondler, Helmut; and Pfleiderer, Wolfgang, to Ciba-Geigy AG. Process for the manufacture of 4-amino-3-aminomethylpiperidine. 3,971,792, Cl. 260-293.520.

Zonic Technical Laboratories, Inc.: *See*—
Riemenschneider, Don H.; Townsend, William L.; and Pehoushek, Joseph W., 3,972,031.

Zook, Herbert A.; and High, Richard W., to United States of America, National Aeronautics and Space Administration. Meteoroid capture cell construction. 3,971,256, Cl. 73-425.200.

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Berkley, David Arthur; Mitchell, Olga Mary Mracek; and Pierce, John Robinson, Re. 28,919.

Berkley, David Arthur; Mitchell, Olga Mary Mracek; and Pierce, John Robinson, to Bell Telephone Laboratories, Incorporated. Speech processor using controlled center clipping. Re. 28,919, Cl. 179-170.800.

Electrophysikaische Anstalt Bernard Berghaus: *See*—
Humbert, Gerhard Philipp, Re. 28,918.

Foust, Michael L.: *See*—
Rice, Charles A.; and Foust, Michael L., Re. 28,916.

Harris, Marvin E., Jr., to Reynolds Metals Company. Wire unreeling system. Re. 28,917, Cl. 72-183.000.

Humbert, Gerhard Philipp, to Electrophysikaische Anstalt Bernard Berghaus. Components of a rotary piston machine. Re. 28,918, Cl. 418-178.000.

Mitchell, Olga Mary Mracek: *See*—
Berkley, David Arthur; Mitchell, Olga Mary Mracek; and Pierce, John Robinson, Re. 28,919.

Pierce, John Robinson: *See*—
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Reynolds Metals Company: *See*—
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Rice, Charles A.; and Foust, Michael L. Inflatable aquatic rescue board and method of rescue. Re. 28,916, Cl. 5-82.00R.

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Angleman, John D., and D. Du Cret, to Bristol-Myers Co. Combined bottle and closure. 240,711, 7–27–76, Cl. D9—10.

Anzai, Shiro, and K. Hirose, to Canon K.K. Electronic calculator. 240,735, 7–27–76, Cl. D26—5.

Barnhart, Charles C., and C. W. Cassidy, to Standard Container Co. Food container. 240,713, 7–27–76, Cl. D9—219.

Baxter Laboratories, Inc.: *See*—
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Beld, John W., W. G. Kinninger, R. E. N. Klohr, and P. A. Byrne, to Puritan-Bennett Corp. Comprehensive infant care system. 240,768, 7–27–76, Cl. D83—1.

Benson, Glenn S. Putter head. 240,749, 7–27–76, Cl. D34—5.

Bernard, Charles, to Airborne S.A. Chair. 240,679, 7–27–76, Cl. D6—31.

Blue, Thomas R. Child's flexion wheelchair. 240,722, 7–27–76, Cl. D12—131.

Bock, Robert E., to O. F. Mossberg & Sons, Inc. Golf club head. 240,748, 7–27–76, Cl. D34—5.

Bowman, Arleen. Container for cosmetics. 240,769, 7–27–76, Cl. D86—10.

Breslow, Jeffrey D., and M. J. Ferris, to Marvin Glass & Associates. Target game board. 240,750, 7–27–76, Cl. D34—5.

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Busse, Harold M. Clamp. 240,704, 7–27–76, Cl. D8—72.

Butcher, Robert M. Floating fountain. 240,732, 7–27–76, Cl. D23—13.

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Dykes, Downer P., to Rival Mfg. Co. Electric can opener. 240,701, 7–27–76, Cl. D8—36.

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Fraker, Roger A. Fluorescent lamp creeper. 240,762, 7–27–76, Cl. D48—20.

Franzen, Hans, and J. Lind, to Sandvik Aktiebolag. Abrader. 240,705. 7–27–76, Cl. D8—90.

Free, David, W. A. Shand, W. Scherrelies, to Naturvard Research (Canada) Ltd. Liquid sterilizer and dispenser. 240,731. 7–27–76, Cl. D23—3.

Fukushima, Kenji. Cigarette paper. 240,740, 7–27–76, Cl. D27—1.

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Gewirs, Eric. Wet suit. 240,670, 7–27–76, Cl. D2—29.

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Goto, Kenjiro, to Mansei Kogyo Kabushiki Kaisha. Cigarette lighter. 240,741, 7–27–76, Cl. D27—42.

Granatelli, Vincent J., to Paxton Products, Inc. Support for razors or the like. 240,681, 7–27–76, Cl. D6—88.

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Halsted, Milton, and T. M. Uyeda, to Chicago Specialty Mfg. Co. Shower spray head. 240,734. 7–27–76, Cl. D23—85.

Harris, Stephen F. Photo album page. 240,726, 7–27–76, Cl. D19—33.

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Hegi, Robert. Combined closure cap and pouring spout. 240,716, 7–27–76, Cl. D9—278.

Henderson, J. Craig, T. G. Teller, and T. H. Morrell, to Owatonna Mfg. Co., Inc. Front end loader. 240,757, 7–27–76, Cl. D40—5.

Herig, Else, to H. L. Sterkel AG, Comet-Pinselfabrik. Handle for paint-rollers and brushes. 240,678, 7–27–76, Cl. D4—38.

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Kleiner, Carl J. Bracelet having transparent prism face. 240,760, 7–27–76, Cl. D45—4.

Klohr, Robert E. N.: *See*—
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Langston, Davey L. Flying toy. 240,753, 7–27–76, Cl. D34—15.

Larkin, John M. Mobile display device. 240,691, 7–27–76, Cl. D6—181.

Larsson, Hans G. I., and S. G. H. Stjarnqvist, to Marco Materialhantering AB. Combined wheel and jack assembly for a hand-operated pallet truck. 240,720, 7–27–76, Cl. D12—60.

Lejeune, Daniel, to Compagnie Generale des Etablissements Michelin. Tire. 240,723. 7–27–76, Cl. D12—142.

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McTear, James R. Baseball glove. 240,671, 7–27–76, Cl. D2—361.
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Miyazaki, Sadayasu. Bank. 240,752, 7–27–76, Cl. D34—11.
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Palm, James M., Jr., to Amerock Corp. Escutcheon. 240,706, 7–27–76, Cl. D8—179.
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Pemberton, John H. Electronic calculator. 240,736, 7–27–76, Cl. D26—5.
Peoples, Susan M. Portable one-way and two-way single coin operated telephone for institutions, hospitals and the like. 240,738, 7–27–76, Cl. D26—14.
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Rendell, Stanley E., to Norlin Music, Inc. Electric guitar or similar article. 240,764, 7–27–76, Cl. D56—1.
Renfro, Joseph T., Jr. Bird feeder. 240,743, 7–27–76, Cl. D30—15.
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386 3,971,214
403 3,971,215
445 3,971,216
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122 3,971,651
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88.5R 3,971,250
170A 3,971,251
193R 3,971,252
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290R 3,971,254
379 3,971,255
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759 3,971,267
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10R 3,971,653
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57.29 3,971,271
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13 3,971,272
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164 3,971,276
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14C 3,971,285
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169 3,971,297
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33H 3,971,299
36.3 3,971,300
84TW 3,971,301
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1.2 3,971,659
33 3,971,660
36.2 3,971,661
76R 3,971,662
91R 3,971,663
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60 3,971,302
CLASS 99
291 3,971,304
295 3,971,305
323.4 3,971,303
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403 3,971,307
467 3,971,308
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2 3,971,309
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93.04 3,971,311
114 3,971,312
127.1 3,971,313
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28R 3,971,320
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86.5 3,971,322
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135 3,971,314
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379 3,971,343
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510 3,971,345
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119R 3,971,351
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179L 3,971,354
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198D 3,971,356
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11CD 3,971,358
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373 3,971,360
390 3,971,361
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138A 3,971,371
142R 3,971,368
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146.2 3,971,369
3,971,373
155 3,971,374
173.1 3,971,375
260 3,971,376
266 3,971,377
285 3,971,378
3,971,379
287 3,971,380
296 3,971,381
303.1 3,971,382
3,971,383
335 3,971,384
351 3,971,385
354 3,971,386
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419P 3,971,388
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CLASS 132
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4R 3,971,395
CLASS 136
86R 3,971,671
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133 3,971,673
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116 3,971,397
119 3,971,398
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205 3,971,400
360 3,971,401
382 3,971,402
459 3,971,403
462 3,971,404
489 3,971,405
493.4 3,971,406
516.15 3,971,407
604 3,971,408
613 3,971,409
3,971,410
625.3 3,971,411
625.5 3,971,412
630.14 3,971,413
630.15 3,971,414
630.19 3,971,415
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CLASS 139
34 3,971,417
116.6 3,971,418
CLASS 140
93R 3,971,419
CLASS 141
231 3,971,420
CLASS 144
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34B 3,971,422
176 3,971,423
CLASS 148
6.27 3,971,674
26 3,971,675
31 3,971,677
111 3,971,678
113 3,971,679
121 3,971,676
CLASS 149
19.8 3,971,681
CLASS 152
209R 3,971,424

418 3,971,425

CLASS 156

11 3,971,682
13 3,971,683
3,971,684
72 3,971,685
104 3,971,668
181 3,971,669
196 3,971,670
212 3,971,686
221 3,971,687
241 3,971,692
273 3,971,693
295 3,971,688
309 3,971,690
415 3,971,694
461 3,971,695
497 3,971,691

CLASS 157

1.28 3,971,426

CLASS 160

166R 3,971,427

CLASS 162

226 3,971,689
271 3,971,696

CLASS 164

46 3,971,428
82 3,971,429
252 3,971,430
278 3,971,431
318 3,971,432
362 3,971,433

CLASS 165

12 3,971,434
78 3,971,435

CLASS 166

70 3,971,436
187 3,971,437
224A 3,971,438
252 3,971,439
270 3,971,440
285 3,971,441
315 3,971,442

CLASS 169

39 3,971,443

CLASS 172

59 3,971,445
311 3,971,446

CLASS 173

128 3,971,447
134 3,971,448

CLASS 174

16R 3,971,877
30 3,971,878
36 3,971,879
3,971,880
41 3,971,894
42 3,971,881
110SR 3,971,882
120SR 3,971,883
3,971,884

CLASS 175

27 3,971,449
107 3,971,450

CLASS 176

11 3,971,697
32 3,971,444
43 3,971,698
52 3,971,699

CLASS 177

1 3,971,451

CLASS 178

6.8 3,971,885
7.1 3,971,886
7.3D 3,971,887
69.5TV 3,971,888

CLASS 179

1AT 3,971,889
1GQ 3,971,890
15AP 3,971,891
15BA 3,971,892
18GE 3,971,893
18HB 3,971,895
84VF 3,971,896
3,971,897
99 3,971,898
3,971,899
156A 3,971,900
3,971,901
170.8 Re.28,919

CLASS 180

1FV 3,971,452
6.48 3,971,453
65R 3,971,454
89R 3,971,455

CLASS 182

90 3,971,456

CLASS 188

18A 3,971,457

CLASS 190

41Z 3,971,458

CLASS 191

30 3,971,459
45R 3,971,460

CLASS 192

18A 3,971,461
105BA 3,971,462
3,971,463

CLASS 194

10 3,971,464

CLASS 195

2 3,971,700
47 3,971,701
63 3,971,702
103.5R 3,971,703

CLASS 197

1R 3,971,465

CLASS 198

20C 3,971,466
164 3,971,467

CLASS 200

5A 3,971,902
6BB 3,971,904
16C 3,971,903
77 3,971,905
157 3,971,906
238 3,971,907
296 3,971,908

CLASS 201

2.5 3,971,704
3,971,705

CLASS 204

15 3,971,710
98 3,971,706
149 3,971,707
159.19 3,971,711
181 3,971,708
3,971,709

CLASS 206

193 3,971,468
452 3,971,469
455 3,971,470
519 3,971,471
521 3,971,472

CLASS 208

208R 3,971,712
226 3,971,713

CLASS 209

73 3,971,473
3,971,474
257 3,971,714
310 3,971,715
396 3,971,716

CLASS 210

59 3,971,717
84 3,971,718
104 3,971,719
196 3,971,720
401 3,971,721
486 3,971,722

CLASS 211

88 3,971,475
134 3,971,476
189 3,971,477

CLASS 212

11 3,971,478

CLASS 213

127 3,971,479

CLASS 214

1BB 3,971,480
6H 3,971,481
27 3,971,482
75G 3,971,483
85.5 3,971,484
313 3,971,485
505 3,971,486

CLASS 215

216 3,971,487
254 3,971,488
261 3,971,489

CLASS 219

10.55F 3,971,909
121L 3,971,910
162 3,971,911
216 3,971,912
284 3,971,913

CLASS 220

2.1A 3,971,490
71 3,971,491

CLASS 222

146HE 3,971,492
185 3,971,493
450 3,971,494

CLASS 224

10 3,971,495

CLASS 226

3 3,971,496

CLASS 227

67 3,971,497
3,971,498

CLASS 228

54 3,971,499
154 3,971,500
248 3,971,501

CLASS 229

14R 3,971,502
37R 3,971,612
38 3,971,503
3,971,504
45R 3,971,505
51TC 3,971,506
72 3,971,507

CLASS 233

4 3,971,508
7 3,971,509
27 3,971,510

CLASS 235

54R 3,971,914
61NV 3,971,915
61.11E 3,971,917
61.7B 3,971,916
92SB 3,971,918
3,971,919
92SH 3,971,920
150.53 3,971,923
151.35 3,971,921
152 3,971,922
156 3,971,924
3,971,925
184 3,971,926
186 3,971,927

CLASS 237

12.3A 3,971,511

CLASS 239

1 3,971,512

CLASS 240

2.1 3,971,928
10.6R 3,971,929

CLASS 241

46R 3,971,513
82.4 3,971,514
175 3,971,515

CLASS 242

4B 3,971,516
18PW 3,971,518
18R 3,971,517
25A 3,971,519
35.5A 3,971,520
47 3,971,521
47.01 3,971,522
55.19A 3,971,523
58.4 3,971,524
110 3,971,525
118.6 3,971,526
118.7 3,971,527
191 3,971,528
211 3,971,529
217 3,971,530

CLASS 243

25 3,971,531

CLASS 244

1R 3,971,532
30 3,971,533
42CD 3,971,534
46 3,971,535
83F 3,971,536

CLASS 248

23 3,971,537
278 3,971,538

CLASS 250

199 3,971,930
213VT 3,971,932
3,971,933
213R 3,971,931
225 3,971,934
262 3,971,935
311 3,971,936
315A 3,971,937
330 3,971,941
336 3,971,938
339 3,971,939
340 3,971,940
363S 3,971,942
372 3,971,943
391 3,971,944
402 3,971,945
422 3,971,946
437 3,971,947
445T 3,971,948
446 3,971,949
451 3,971,950
458 3,971,951
461B 3,971,952
469 3,971,953
475 3,971,954
507 3,971,955
529 3,971,539
571 3,971,956

CLASS 251

58 3,971,542
143 3,971,540
347 3,971,541

CLASS 252

62.51 3,971,723
63.2 3,971,724
106 3,971,725
132 3,971,726
135 3,971,727
180 3,971,728
187R 3,971,729
3,971,730
301.15 3,971,732
301.32 3,971,731
311 3,971,733
389A 3,971,734
432 3,971,735

CLASS 254

134.3FT 3,971,544
134.3R 3,971,543
173R 3,971,545

CLASS 256

14 3,971,546

CLASS 260

2M 3,971,742
3.3 3,971,743
23EM 3,971,744
29.2TN 3,971,745
29.7D 3,971,746
33.4PQ 3,971,749
37EP 3,971,750
37SB 3,971,747
37R 3,971,748
3,971,751
40R 3,971,752
42.14 3,971,753
42.15 3,971,754
42.45 3,971,755
45.7R 3,971,756
45.8N 3,971,757
45.9KA 3,971,758
3,971,759
3,971,760
3,971,761
3,971,762
3,971,763
77.5AM 3,971,764
78A 3,971,765
112.5LH 3,971,737
112.5R 3,971,736
146R 3,971,738
151 3,971,739
158 3,971,740
173 3,971,741
186 3,971,769
3,971,770
207 3,971,771
239BC 3,971,774
239.1 3,971,775
3,971,776
239.5 3,971,777
239.55R 3,971,772
3,971,773
243C 3,971,778
3,971,779
3,971,780
246B 3,971,781
251R 3,971,782
256.4Q 3,971,783
256.5R 3,971,784
286R 3,971,787
3,971,788
3,971,789
287K 3,971,790
3,971,791
293.52 3,971,792
293.58 3,971,793
293.68 3,971,794
293.88 3,971,795
294.8E 3,971,797
294.8F 3,971,796
295CA 3,971,798
295R 3,971,799
295.5B 3,971,800
3,971,801
306.8R 3,971,802
307A 3,971,803
309.5 3,971,813
309.7 3,971,804
325PH 3,971,805
326.28 3,971,806
326.9 3,971,807
330.5 3,971,814
345.2 3,971,808
345.9 3,971,809
347.8 3,971,811
380 3,971,812
400 3,971,815
410.9R 3,971,816
429.7 3,971,817
448.2E 3,971,818
465D 3,971,819
465E 3,971,821
465.5R 3,971,820
468R 3,971,822
473R 3,971,824
490 3,971,823
514D 3,971,825
520B 3,971,826
526N 3,971,827
534S 3,971,828
570D 3,971,829
601R 3,971,830
3,971,831
621R 3,971,832
632A 3,971,833
837R 3,971,834
876R 3,971,835
963 3,971,836

CLASS 264

46.6 3,971,837
51 3,971,838
112 3,971,839
231 3,971,840
268 3,971,785
275 3,971,841

CLASS 266

215 3,971,549
218 3,971,548
244 3,971,547

CLASS 267

57.1R 3,971,550
65R 3,971,551

CLASS 269

228 3,971,552

CLASS 271

3 3,971,553
195 3,971,554

CLASS 272

56.5R 3,971,561
118 3,971,555
122 3,971,556

CLASS 273

1E 3,971,557
25 3,971,558
26R 3,971,559
30 3,971,560
95R 3,971,562

CLASS 277

27 3,971,563
30 3,971,564
59 3,971,565
206R 3,971,566

CLASS 280

33.99H 3,971,568
276 3,971,571
618 3,971,567
733 3,971,569
746 3,971,570

CLASS 281

46 3,971,572

CLASS 285

5 3,971,573
31 3,971,574
85 3,971,575
87 3,971,576
238 3,971,577
260 3,971,578
353 3,971,579

CLASS 292

201 3,971,580
251.5 3,971,581
268 3,971,582

CLASS 293

71P 3,971,583

CLASS 294

88 3,971,584
3,971,585

CLASS 296

1S 3,971,586
28R 3,971,588
76 3,971,589
104 3,971,590

CLASS 297

191 3,971,591
217 3,971,592
452 3,971,587

CLASS 299

8 3,971,593
39 3,971,594

CLASS 303

21F 3,971,595
40 3,971,596

CLASS 305

10 3,971,597

CLASS 307

64 3,971,957
106 3,971,958
225R 3,971,959
268 3,971,961

CLASS 308

3A 3,971,599
3R 3,971,598
8.2 3,971,600
16 3,971,601
160 3,971,602
168 3,971,603
183 3,971,604
238 3,971,606

CLASS 310

8.1 3,971,962
154 3,971,963

CLASS 312

38 3,971,607
198 3,971,605
257R 3,971,608

CLASS 313

355 3,971,964

CLASS 315

3.5 3,971,965
39.3 3,971,966
97 3,971,967
108 3,971,968

CLASS 317

148.5B 3,971,969
230 3,971,970

CLASS 318

203A 3,971,971
227 3,971,972
251 3,971,973
341 3,971,974

CLASS 321

4 3,971,976
18 3,971,975

CLASS 322

1 3,971,977
68 3,971,978

CLASS 323

1 3,971,979

CLASS 324

29.5 3,971,980
37 3,971,982
41 3,971,983
43R 3,971,981
132 3,971,984

CLASS 325

21 3,971,985
37 3,971,986
38B 3,971,987
316 3,971,988
363 3,971,989
400 3,971,990
464 3,971,991
3,971,992

CLASS 328

127 3,971,993
133 3,971,994
149 3,971,995
155 3,971,996
165 3,971,997
167 3,971,998
206 3,971,960

CLASS 329

105 3,971,999
3,972,000

CLASS 330

22 3,972,001
28 3,972,002
30D 3,972,003
35 3,972,004
43 3,972,005
107 3,972,006

CLASS 331

94.5PE 3,972,009
94.5C 3,972,008
94.5F 3,972,007

CLASS 333

14 3,972,010
30R 3,972,011
84M 3,972,012
97R 3,972,013

CLASS 337

1 3,972,052
202 3,972,015
354 3,972,016

CLASS 338

165 3,972,017

CLASS 339

14P 3,971,609
17R 3,971,610
34 3,971,611
59R 3,971,613
89R 3,971,614
98 3,971,615
3,971,616
113L 3,971,617
143R 3,971,618
189R 3,971,619

CLASS 340

10 3,972,018
15.5AF 3,972,020
15.5TS 3,972,019
38P 3,972,021

52D	3,972,022
172.5	3,972,023
	3,972,024
	3,972,025
	3,972,026
	3,972,027
	3,972,028
	3,972,029
	3,972,030
173CC	3,972,032
173R	3,972,031
	3,972,033
	3,972,034
174TF	3,972,035
	3,972,036
	3,972,037
189M	3,972,038
280	3,972,039
324M	3,972,040

CLASS 343

7.7	3,972,041
17.2PC	3,972,042
18B	3,972,043
106D	3,972,044
705	3,972,045
709	3,972,046
	3,972,047
712	3,972,048
829	3,972,049
846	3,972,050

CLASS 346

1	3,972,051
75	3,972,053

CLASS 350

26	3,971,620
87	3,971,621
	3,971,622
103	3,971,623
160R	3,971,624

CLASS 354

15	3,972,054
24	3,972,055
25	3,972,056
27	3,972,057
149	3,972,058

CLASS 357

6	3,972,059
30	3,972,060
38	3,972,061
39	3,972,014
68	3,972,062
82	3,972,063

CLASS 358

4	3,972,064
10	3,972,065
76	3,972,066
81	3,972,067

CLASS 360

4	3,972,068
48	3,972,069
77	3,972,070
86	3,972,071
93	3,972,072
	3,972,073
130	3,972,074

CLASS 418

178	Re.28,918

CLASS 422

195	3,971,869

CLASS 423

7	3,971,842
112	3,971,843
182	3,971,844
483	3,971,845
645	3,971,846
650	3,971,847

CLASS 424

180	3,971,848
	3,971,849
263	3,971,786
324	3,971,850
347	3,971,810

CLASS 426

103	3,971,852
249	3,971,853
281	3,971,854
321	3,971,855
417	3,971,856
548	3,971,857
597	3,971,858
618	3,971,859
646	3,971,851

CLASS 427

43	3,971,860
247	3,971,861
329	3,971,862

CLASS 428

40	3,971,865
	3,971,866
45	3,971,867
194	3,971,868
336	3,971,870
392	3,971,871
407	3,971,863
412	3,971,872
423	3,971,864
432	3,971,874
463	3,971,873
537	3,971,680

CLASS 526

65	3,971,767
68	3,971,768
317	3,971,766

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D 2—	29	240,670
	361	240,671
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		240,673
		240,674
		240,675
		240,676
D 4—	25	240,677
	38	240,678
D 6—	31	240,679
	62	240,680
	88	240,681
	97	240,682
	139	240,683
	144	240,684
	148	240,685
	149	240,686
	158	240,687
	168	240,688
	174	240,689
	177	240,690
	181	240,691
	246	240,692
		240,693
D 7—	23	240,694
		240,695
	131	240,696
	151	240,697
	170	240,698
	181	240,699
D 8—	35	240,700
	36	240,701
		240,702
	71	240,703
	72	240,704
	90	240,705
	179	240,706
	208	240,707
	228	240,708
	233	240,709
	235	240,710
D 9—	10	240,711
	190	240,712
	219	240,713
		240,714
	259	240,715
	278	240,716
D10—	6	240,717
	126	240,718
		240,718
D12—	54	240,719
		240,719
	60	240,720
	78	240,721
	131	240,722
	142	240,723
D16—	8	240,766
		240,766
	26	240,765
		240,765
D19—	33	240,726
D22—	18	240,728
	19	240,729
	27	240,730
D23—	3	240,731
	13	240,732
	19	240,733
	35	240,734
	58	240,727
D25—	75	240,725
	89	240,724
D26—	5C	240,735
		240,736
		240,737
	14A	240,738
		240,739
D27—	1	240,740
	42	240,741
D30—	8	240,742
	15	240,743
D32—	2C	240,744
D34—	4R	240,745
	5GH	240,748
		240,749
		240,751
	JJ	240,750
	SS	240,746
	J	240,747
	11R	240,752
	15W	240,753
D35—	1	240,754
	3R	240,755
D39—	1	240,756
D40—	5	240,757
D45—	1A	240,758
	4C	240,760
	16A	240,759
D48—	20D	240,762
	R	240,761
D54—	4	240,763
D56—	1A	240,764
D83—	G	240,768
	U	240,767
D86—	10N	240,769

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PATENTS

1	:	Re.28,917		3,971,400		3,972,061		3,971,947		3,971,748	3,971,494
		3,971,306		3,971,405		3,972,074	13 :	3,971,138		3,971,768	3,971,536
2	:	3,971,330		3,971,455	8 :	3,971,439		3,971,159		3,971,827	3,971,559
		3,971,441		3,971,456		3,971,617		3,971,549		3,971,856	3,971,592
		3,971,716		3,971,473		3,971,880		3,971,590		3,971,879	3,971,618
4	:	3,971,208		3,971,488		3,971,895		3,971,686		3,971,907	3,971,631
		3,971,270		3,971,492		3,971,925	15 :	3,972,048		3,971,946	3,971,661
		3,971,317		3,971,496	9 :	3,971,145	16 :	3,971,532		3,971,984	3,971,703
		3,971,374		3,971,499		3,971,150	17 :	3,971,077		3,971,988	3,971,727
		3,971,531		3,971,514		3,971,410		3,971,081		3,971,995	3,971,733
		3,971,568		3,971,535		3,971,482		3,971,082		3,972,001	3,971,836
		3,971,960		3,971,551		3,971,525		3,971,086		3,972,053	3,971,930
		3,971,975		3,971,552		3,971,542		3,971,088		3,972,062	3,971,931
		3,971,999		3,971,555		3,971,575		3,971,105		3,972,070	3,971,989
		3,972,042		3,971,560		3,971,620		3,971,130		3,972,073	3,971,997
5	:	3,971,297		3,971,566		3,971,663		3,971,146	18 :	3,971,153	3,972,065
		3,971,544		3,971,573		3,971,802		3,971,147		3,971,210	25 : 3,971,073
6	:	3,971,109		3,971,574		3,971,826		3,971,165		3,971,216	3,971,126
		3,971,121		3,971,580		3,971,890		3,971,173		3,971,348	3,971,141
		3,971,125		3,971,582		3,971,917		3,971,183		3,971,480	3,971,193
		3,971,131		3,971,649		3,971,935		3,971,187		3,971,487	3,971,219
		3,971,134		3,971,650		3,971,987		3,971,189		3,971,489	3,971,269
		3,971,152		3,971,684	10 :	3,971,095		3,971,197		3,971,633	3,971,289
		3,971,157		3,971,729		3,971,108		3,971,242		3,971,756	3,971,411
		3,971,162		3,971,774		3,971,202		3,971,275		3,971,970	3,971,443
		3,971,164		3,971,847		3,971,234		3,971,280	19 :	3,971,076	3,971,474
		3,971,171		3,971,850		3,971,587		3,971,284		3,971,101	3,971,721
		3,971,186		3,971,869		3,971,627		3,971,300		3,971,180	3,971,785
		3,971,196		3,971,877		3,971,691		3,971,365		3,971,199	3,971,841
		3,971,211		3,971,878		3,971,743		3,971,380		3,971,469	3,971,854
		3,971,230		3,971,909		3,971,749		3,971,384		3,971,714	3,971,863
		3,971,232		3,971,920		3,971,767		3,971,396	20 :	3,971,243	3,971,872
		3,971,238		3,971,927		3,971,781		3,971,426		3,971,368	3,971,928
		3,971,247		3,971,940		3,971,983		3,971,432		3,971,378	3,971,976
		3,971,255		3,971,950	11 :	3,971,910		3,971,461	21 :	3,971,283	3,971,990
		3,971,271		3,971,962	12 :	3,971,140		3,971,464		3,971,361	3,972,002
		3,971,278		3,971,993		3,971,148		3,971,470		3,971,413	3,972,007
		3,971,279		3,971,996		3,971,251		3,971,476		3,971,500	3,972,029
		3,971,290		3,972,005		3,971,259		3,971,490		3,971,680	3,972,030
		3,971,305		3,972,006		3,971,286		3,971,506	22 :	3,971,102	3,972,039
		3,971,327		3,972,008		3,971,294		3,971,507		3,971,436	3,972,044
		3,971,335		3,972,013		3,971,318		3,971,541		3,971,442	3,972,057
		3,971,338		3,972,026		3,971,402		3,971,557		3,971,538	3,972,058
		3,971,346		3,972,032		3,971,435		3,971,562		3,971,713	26 : 3,971,097
		3,971,350		3,972,034		3,971,454		3,971,564		3,971,728	3,971,112
		3,971,362		3,972,038		3,971,533		3,971,603	23 :	3,971,526	3,971,116
		3,971,363		3,972,041		3,971,546		3,971,612	24 :	3,971,110	3,971,163
		3,971,364		3,972,043		3,971,605		3,971,614		3,971,257	3,971,221
		3,971,367		3,972,045		3,971,621		3,971,629		3,971,285	3,971,240
		3,971,377		3,972,049		3,971,844		3,971,643		3,971,321	3,971,273
		3,971,387		3,972,050		3,971,891		3,971,720		3,971,428	3,971,332

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U.S. DEPARTMENT OF COMMERCE

Elliot L. Richardson, Secretary

PATENT AND TRADEMARK OFFICE

C. Marshall Dann, Commissioner